

GEOLOGICAL SURVEY OF CANADA

ROBERT BELL, M.D., D.Sc., LL.D., F.R.S., ACTING DIRECTOR.

CATALOGUE.

OF THE

MARINE INVERTEBRATA

OF

EASTERN CANADA.

BY

J. F. WHITEAVES, LL.D., F.G.S., F.R.S.C.

PALEONTOLOGIST, ZOOLOGIST, AND ASSISTANT DIRECTOR.



OTTAWA

PRINTED BY S. E. DAWSON, PRINTER TO THE KING'S MOST
EXCELLENT MAJESTY

1901

No. 722.

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In view of the establishment of a Marine Biological Station in the Maritime Provinces within the last three years, it is thought desirable to publish a 'Catalogue of the Marine Invertebrata of Eastern Canada.' The object of this Catalogue is to give a succinct idea of the present state of our knowledge of these invertebrata, so far as the identification of species, their geographical distribution, and bathymetrical range in the northern portion of the western side of the Atlantic are concerned.

It is hoped that this publication will act as a stimulus to renewed activity in the study of marine zoology, and that it will be of use not only to zoologists, but also to students of the fossils of the post-tertiary deposits of the eastern portion of the Dominion.

ROBERT BELL.

GEOLOGICAL SURVEY OFFICE
OTTAWA, June 26, 1901.

CATALOGUE OF THE MARINE INVERTEBRATA

OF

EASTERN CANADA

BY

J. F. WHITEAVES.

This Catalogue may be regarded as a report on the present state of our knowledge of the Marine Invertebrata of the Bay of Fundy, Atlantic coast of Nova Scotia, and Gulf and mouth of the River St. Lawrence, as far to the northward as the Strait of Belle Isle. Incidentally and parenthetically, however, it also includes the names of a few species that have been found on the coast of Labrador or in Hudson Strait or Bay, but not yet as far south as the Gulf of St. Lawrence. It consists of a systematic list of all the species from the eastern Canadian seaboard that have so far been identified or described, with notes on their geographical distribution and bathymetrical range. The localities at which some of the species are found fossil in the Pleistocene deposits of eastern Canada, are also briefly indicated.

As regards nomenclature, it may be stated that in many cases only one name is given to each species; that in others a few of those synonyms that are thought to be most likely to be useful to Canadian students are added; but that in no case has any complete or exhaustive list of synonyms been attempted. Many of the dates appended to these names or synonyms, too, are quoted at second hand, as the writer has not access to the original descriptions.

The following is a brief description of the principal zoological explorations, by dredging or otherwise, or collections, in the region in question, upon which this catalogue is based.

Dawson, Sir J. W.

1835 to 1853.—Collected specimens of marine invertebrata on the coast of Nova Scotia. Unfortunately, no description of any of these collections has been published, beyond a few isolated references to some of the species in his "Handbook of Zoology," published in 1870.

1858.—Dredged for a few days in Gaspé Bay, in August. Many of the species collected at this locality are enumerated or described in three papers contributed to the "Canadian Naturalist and Geologist" for 1858 and 1860, (vols. III. and V.). The first of these is entitled "A Week in Gaspé;" the second "On Sea Anemones and Hydroid Polyps from the Gulf of St. Lawrence;" and the third, "On the Tubicolous Marine Worms of the Gulf of St. Lawrence."

1859 to 1876.—Dredged in the Gulf and mouth of the River St. Lawrence, from Gaspé to Kamouraska and Murray Bay, including various places on the north and south shores of the river.

1871.—The Report on the Geological Structure and Mineral Resources of Prince Edward Island, by Sir J. W. Dawson and Dr. B. J. Harrington, contains a list of the marine shells of that island, collected by Mr. W. B. Dawson.

1876–1882.—Made his headquarters at Little Métis, and dredged above and below that place nearly every summer until 1882, and made some collections in later years. His chief object was to ascertain how many of the species found in the pleistocene clays and sands still live in the St. Lawrence estuary, and what variety of changes, if any, they have experienced in the intervening time.

No separate lists of the species dredged during these years have been published, and much of the material collected has yet to be studied. Still, in his papers on Canadian pleistocene fossils, and especially in his latest list of those fossils, in the "Canadian Ice Age," published in 1893, there are many references to recent species.

Willis, J. R.

1850 to 1863 or a little later.—Collected mollusca, &c., on the Atlantic coast of Nova Scotia (especially from the fishing banks off Halifax, and at Sable Island) and published a list of them, in 1862, in the eighth volume of Proceedings of the Boston Society of Natural History. His latest and most important list of Nova Scotia shells, privately printed in November, 1863, is reprinted in vol. VII., pt. 4 (1890) of the Transactions of the Nova Scotia Institute of Natural Science.

Stimpson, Dr. W.

1852.—Dredged and otherwise collected for three months at Grand Manan Island and its vicinity, in the Bay of Fundy. His "Synopsis of the Marine Invertebrata of Grand Manan," published in 1853, which is based on these collections, is by far the most important and comprehensive contribution to the literature of the marine zoology of eastern Canada that had appeared up to that date, and it is still indispensable to the student of this subject.

The nomenclature of the Amphipoda in this "Synopsis" has been revised by the Rev. Thomas R. R. Stebbing, in vol. xxix., pt. 1, of the Zoological Reports of the Challenger Expedition.

Bell, Dr. Robert.

1858.—Collected on the south-east shore of the River and Gulf of St. Lawrence, from Rimouski to Gaspé Bay, and dredged off Marsouin. Published a list of most of the species obtained, in 1859, in the Report of Progress of the Geological Survey of Canada for 1858, and in the fourth volume of the "Canadian Naturalist and Geologist." The tubicolous annelids and the polyzoa in this list were determined by Sir J. W. Dawson.

1884.—Dredged at Port Burwell, on the east coast of Ungava Bay, in the District of Ungava; and at Ashe Inlet, Big Island, north coast of Hudson Strait, in the District of Franklin. A list, by Professor S. I. Smith, of the Crustacea obtained in these dredgings, and one by the present writer, of the Mollusca, &c., form Appendix iv. to Dr. Bell's report in the Report of Progress of this Survey for 1882-83-84.

Packard, Dr. A. S.

1860.—Dredged near Caribou Island in July and August of this year, and published a list of the species obtained, in the Canadian Naturalist and Geologist for December, 1863 (vol. viii., p. 401). Caribou Island is in the province of Quebec, on the north shore of the Gulf of St. Lawrence, off Salmon Bay, a little to the east of Esquimaux Bay and just inside of the Strait of Belle Isle.

1864.—Dredged and otherwise collected from Little Mecattina Island, in the Gulf of St. Lawrence, to Hopedale, on the Atlantic coast of Labrador. His "View of the Invertebrate Fauna of Labrador", published in 1867, in the first volume of the Memoirs of the Boston Society of Natural History, includes specimens that were dredged in 1860 as well as in 1864. The nomenclature of the Crustacea in this paper was revised by Professor S. I. Smith in 1883, in the sixth volume of the Proceedings of the United States National Museum.

Verrill, Professor A. E.

1861.—In this year collections were made and some dredging was done off Anticosti and the Mingan Islands by Professors Verrill, Hyatt and Shaler on behalf of the Museum of Comparative Zoology at Cambridge, Massachusetts. A list of the species in these collections was contributed by Professor Verrill to Dr. Packard's paper on the Caribou Island dredgings of 1860.

1868 and 1870.—In both of these years Professor Verrill collected at Grand Manan Island, in the Bay of Fundy. In 1868 he was assisted by Professor S. I. Smith, H. E. Webster and Rev. Geo. A. Jackson, and in 1870 by Mr. Oscar Harger and C^t H. Dwinelle.

Professor Verrill's later explorations in Canadian waters were carried on under the auspices of the United States Fish Commission, and will be referred to under that heading.

Whiteaves, J. F.

1867 and 1869.—During each of these years the writer dredged at many localities in Gaspé Bay and off Cap des Rosiers (Cape Rosier) light-house and village. Lists of the Mollusca, &c., obtained in these dredgings were published in the fourth and fifth volumes of the new series of the Canadian Naturalist.

1871, 1872 and 1873.—Facilities having been afforded by the Department of Marine and Fisheries of the Dominion Government, for these three years, dredging operations were carried on in each, in the deepest parts of the Gulf of St. Lawrence (from 100 to 313 fathoms) at a long distance from shore, at many localities to the north, south-east and south of the Island of Anticosti. Under the same auspices, also, in 1871, dredging was done at several places on the north shore of the Gulf, from Point des Monts to the Mingan Islands; in 1872, off Percé and at the Magdalen Islands; and, in 1873, off Cap d'Espoir (Cape Despair) and Grand Pabou, on the Bradelle and Orphan Banks, at several localities between Prince Edward and Cape Breton islands, and throughout Northumberland Strait, on both sides.

Preliminary reports on the species obtained in these dredgings were published in the Reports of the Department of Marine and Fisheries for 1871, 1872 and 1873; in volumes VI. and VII. of the new series of the Canadian Naturalist; in the Annals and Magazine of Natural History for November, 1872 (Ser. iv., vol. x.); and in the American Journal of Science for March, 1874.

United States Fish Commission.

1872.—Under the auspices of the U. S. Fish Commissioner, collections were made in the Bay of Fundy, at Grand Manan Island, and a series of dredgings were made first at Halifax and the Le Have Bank, Nova Scotia, and afterward in the region of St. George's Banks and the adjacent waters, on board the coast survey SS. Bache. Professor Verrill had general charge of the dredging operations and the collection of invertebrates, but during the first cruise of the Bache, the dredgings were in charge of Professor S. I. Smith and Mr. Oscar Harger.

1877.—“During a part of the season the work” of the commission “was transferred to Halifax, Nova Scotia, where large collections were made and whence the dredging” (by the SS. *Speedwell*) “was extended to the deep waters one hundred and twenty miles south of that city. On the passage from Salem to Halifax, dredgings were made in the deep waters of the Gulf of Maine and off the southern portion of the Nova Scotia coast” (S. J. Smith, 1879).

1883.—On the last day of August and first five days of September of this year, the U. S. Fish Commission SS. *Albatross* dredged off Cape Sable, Nova Scotia, at twenty different stations and at depths of from 49 to 1309 fathoms.

Many of the species obtained in these and other dredgings or collections have been described or reported upon by Professor Verrill, Professor S. I. Smith, or Mr. Oscar Harger, in papers contributed to the Annual Reports of the United States Fish Commission, to the Proceedings of the American Association for the Advancement of Science, and of the United States National Museum, to the Transactions of the Connecticut Academy, or to the American Journal of Science.

H. M. S. Challenger Expedition

1873.—Dredged at three stations off the coast of Nova Scotia, but one of these is so far from land as to be outside of the scope of this paper. Descriptions or determinations of the species obtained at these stations are scattered through the zoological reports of the expedition.

Verkruzen, T. A.

1876.—Visited Newfoundland and Nova Scotia in order to collect and study Mollusca at each of these localities, and published four papers on the specimens obtained. The first of these papers, entitled “Mollusca dredged and collected by T. A. Verkruzen, in 1876, in the neighbourhood of St. Johns, Newfoundland, including a few species obtained in the Bay of Fundy,” is a small pamphlet published at St. Johns, Newfoundland, in 1877. The second, “Die Fauna von Neu Schottland (Nova Scotia) und Neufundland,” was published in the *Jahrbuch der Deutschen Malacologischen Gesellschaft* for 1878, and the third, “Die Mollusken Neufundlands und der Neufundland Bänke,” in *Der Sammler* (Berlin) for 1885, and the fourth, “Die Meeres Mollusken Neufundlands,” in the same journal for 1886.

Jones, J. Matthew.

1877.—Published a “List of the Mollusca of Nova Scotia,” in the Proceedings and Transactions of the Nova Scotia Institute of Natural Science, vol. iv., part 3.

Stearns, W. A.

1882.—During the month of August in this year an expedition, under the direction of Mr. Stearns, dredged in shallow water at different points on the Labrador coast, between Forteau Bay, in the Strait of Belle Isle, to Dead Island, near Square Island. The Crustacea obtained on this expedition were reported on by Professor S. I. Smith, and the Mollusca and Echinodermata by Miss Katharine J. Bush, Ph. D., in 1883, in two papers published in the sixth volume of Proceedings of the United States National Museum.

Turner, Lucien M.

1882-85.—Collected marine invertebrata for the United States National Museum at Labrador and Ungava, from Rigolet to Fort Chimo. A list by Dr. W. H. Dall, of the mollusca obtained by Mr. Turner at these localities, was published in 1886, in the ninth volume of Proceedings of the United States National Museum.

Ganong, Professor W. F.

1884-1888.—In 1884-1887, both years inclusive, dredged in Passamaquoddy Bay, around Fryes Island, in L'Etang and Eastport Harbours; and in 1888, among the islands at Grand Manan, N.B. Published the following papers on part of the material obtained, in the Bulletins of the Natural History Society of New Brunswick. "The Invertebrata of Passamaquoddy Bay" (Bul. No. iv.); "The Marine Mollusca of New Brunswick" (Bul. No. vi.); "The Echinodermata of New Brunswick" (Bul. No. vii.); "The Economic Mollusca of Acadia" (Bul. No. viii.); and "Zoological Notes" (on mollusca, echinodermata and hydrozoa) in Bul. No. IX.

Winkley, Rev. Henry W.

1888.—Examined barrels of oysters from New Brunswick and Prince Edward Island, and published a list of the "Mollusca found in the oyster beds of Cocagne," N.B. "Bedeque and Summerside," P.E.I., in Bulletin No. VII. of the Natural History Society of New Brunswick.

Low, A. P.

1894.—Made a small collection of shore shells on the Atlantic coast of Labrador, between Sandwich Bay and Hamilton Inlet.

1897.—Dredged on the south side of Hudson Strait, between King George Sound and the bottom of Ungava Bay.

1898.—Dredged on the east coast of Hudson Bay, near the mouth of the Povungnituk River.

1899.—Dredged on the east coast of Hudson Bay, in Richmond Gulf, in 15 to 25 fathoms, soft mud.

Wakeham, Commander W.

1897.—During the Hudson Bay Exploring Expedition of this year, in the SS. Diana, Dr. Wakeham, the officer in charge, dredged on the west side of Hudson Bay, twenty miles off Churchill (Keewatin) in 20 fathoms.

It has long been known that there are areas of shallow and comparatively warm water, tenanted by a northern extension of the "Acadian fauna," in the southern portion of the region under consideration. According to Verrill, the Acadian fauna was "named by Lutken, but first distinguished as the Nova Scotian by Dana. "It extends from the Syrtensian southwardly to Cape Cod, close to the shore, but pushes further southward in deeper water, and at a distance from the shore."* In the Maritime Provinces this northern extension of the Acadian fauna seems to occupy the shallower and more sheltered portions of the Bay of Fundy, such as Passamaquoddy Bay and the Minas Basin; and of the Atlantic coast of Nova Scotia, as in Halifax Harbour and the shores of Sable Island. In the Gulf of St. Lawrence it probably embraces or surrounds the Magdalen Islands, and is definitely known to occupy the whole of the sea bottom between Cape Breton and Prince Edward islands, and of Northumberland Strait; also the shallow water on the north-east coast of New Brunswick, to Carraquette Bay, on the southern side of the Baie des Chaleurs. Among the more characteristic mollusca of the Acadian fauna in Canada are both varieties of the American oyster (*Ostrea Virginica*) and the Quahog or hard-shelled clam (*Venus mercenaria*). Besides these, the following species may be noted as also very characteristic of this fauna, though some of them are rare and local in Canadian waters. An asterisk is prefixed to those of which the writer has seen no authentic Canadian specimens.

Pecten gibbus, var. *borealis*.

**Nucula proxima*.

**Cardium* (*Lævicardium*) *Mortoni*.

Astarte castanea.

" *undata*.

Callista convexa.

Petricola pholadiformis.

Mulinia lateralis.

Cumingia tellinoides.

**Solenomya velum*.

* " *borealis*.

Clidiophora Gouldiana.

**Lyonsia hyalina*.

Dentalium entalis.

Turbonilla interrupta, var. *fulvocincta*.

Odostomia trifida.

Crepidula fornicata.

" *plana*.

Crucibulum striatum.

Bittium nigrum.

Cerithiopsis Greenii.

Urosalpinx cinerea.

Astyris lunata.

Nassa (*Ilyanassa*) *obsolata*.

Neptunea decemcostata.

Tofhatina canaliculata.

It will be noticed that, with the exception of the *Dentalium* and possibly of the *Turbonilla* and the two *Crepidulæ*, all of these are purely American

* U. S. Fish Commission, Report for 1871-72, published in 1873, p. 782.

species, that apparently do not occur on the European side of the North Atlantic. Not one of their names, except doubtfully that of the *Dentalium*, is to be found in the list of ninety-three species of "Boreal shells common to Europe and North America," on pages 358 and 359 of Woodward's "Manual of the Mollusca."

Every other part of the region under consideration, whether the water be deep or shallow, seems to be tenanted by a northern, cold water and sub-arctic, but perhaps scarcely arctic or polar fauna, which gradually merges into a purely arctic assemblage near the Arctic Circle. This cold water fauna occupies not only the deeper parts of the Bay of Fundy, the colder waters of the Atlantic coast of Nova Scotia and by far the greater part of the Gulf and mouth of the River St. Lawrence, but also, apparently, the Atlantic coast of Labrador, Hudson Strait, and most of the coast of Hudson Bay. At any rate, the marine invertebrata of the three last mentioned localities, so far as known, are remarkably similar to those of the River and Gulf of St. Lawrence. In the case of the mollusca, the only species from Labrador that have not yet been found in the Gulf of St. Lawrence, are *Acmea rubella*, which, however, occurs in Willis' list of Nova Scotian shells, and *Crenella faba*, if that shell be distinct from *C. pectinula*. Similarly, in small collections received of late years from four localities in Hudson Strait and the east coast of Hudson Bay, the only mollusca noticed that have not yet been found in the Gulf of St. Lawrence, are *Portlandia glacialis* and *Margarita umbilicalis*.

This cold water assemblage Packard has called the "Syrtensian fauna," a term which, unfortunately, is not free from objections, for more reasons than one. In the first place, in eastern Canada it is the Acadian that is the only exclusively shallow water fauna, and in the next the Gulf of St. Lawrence, as a whole, is rather a deep than a shallow depression. In its deepest part, about half way between the eastern extremity of the Island of Anticosti and the Bird Rocks, it is 313 fathoms deep, and a considerable portion of its area is deeper than 100 fathoms. In the writer's judgment, the fauna which Packard calls the Syrtensian is the west Atlantic portion of the true Boreal fauna, which seems to "extend across the Atlantic," not so much from "Nova Scotia and Massachusetts," as stated by S. P. Woodward (on page 357 of his Manual of the Mollusca), but from Maine, Nova Scotia, the Gulf of St. Lawrence and Atlantic coast of Labrador, "to Iceland, the Faeroe and Shetland islands, and along the coast of Norway from North Cape to the Naze."

Collections made by the Stearns expedition to the Labrador coast, by Dr. Bell and Mr. Low, show also that some species that have been dredged in the Gulf of St. Lawrence in comparatively deep water, occur to the northward in much shallower water. Thus, in the Gulf of St. Lawrence *Pecten*

Grœnlandicus was dredged in abundance, living, by the writer, in 1871, 1872 and 1873, at depths of from about 100 to 313 fathoms; but on the east coast of Hudson Bay, in Richmond Gulf, large living examples of the same species were recently dredged by Mr. Low in from 15 to 25 fathoms. This, no doubt is an extreme case, and conversely it may be mentioned that a brachiopod (*Terebratulina septentrionalis*) which is not uncommon at Eastport (Maine) and Passamaquoddy Bay, N.B., in shallow water, has so far been dredged in the Gulf of St. Lawrence only in very deep water.

During the preparation of this catalogue, the writer has been greatly indebted to Professor J. Playfair McMurrich for notes on some critical species of Zoantharia; to Professor W. C. M'Intosh for much valuable information about the Chaetopoda; to the Rev. Canon Norman for the identification of several species of Polyzoa; to Dr. W. H. Dall for an expression of his views on some species of Mollusca; to Professor Verrill and Miss Bush for recent re-determinations of the difficult species of the molluscan genus *Bela*; and to the Natural History Society of New Brunswick, per Dr. G. F. Matthew, and Professor G. T. Kennedy, for the loan of specimens of mollusca, &c., from the Bay of Fundy.

PROTOZOA

RETICULARIA (FORAMINIFERA).

In all dredgings upon sandy or muddy bottoms in this region, the shells of foraminifera are very abundant, though the habits of their living occupants have yet to be studied. Most of these shells occur at all depths, but in the Gulf of St. Lawrence *Uvigerina angulosa*, *Cristellaria rotulata*, *Vaginulina spinigera*, *Bulimina aculeata*, *Valvulina conica*, *Rhabdammina abyssorum*, and *Biloculina oblonga* have as yet only been found in very deep water. The types of *Lituola findens* (now called *Reophax findens*), of *Lituola cassia* (now known as *Haplophragmium cassia*), and of *Hippocrepina indivisa*, described by Parker in the Canadian Naturalist and Geologist for June, 1870, and in the American Journal of Science and Arts for June, 1872, are all from Gaspé Bay and its immediate vicinity.

The following is a list of the species that have so far been recognized as having been collected in the Gulf of St. Lawrence:

Family Nummulinide.

Polystomella striatopunctata, F. and M. | *Polystomella arctica*, P. and J.
Nouionina scapha, F. and M.

Family *Rotalidae*.

<i>Rotalia</i> Beccarii, L.	<i>Truncatulina lobatula</i> , W. and J.
<i>Pulvinulina</i> Karsteni, Reuss.	<i>Patellina corrugata</i> , Williamson.

Family *Globigerinidae*.

Globigerina bulloides, d'Orb.

Family *Lagenidae*.

<i>Uvigerina pygmaea</i> , d'Orb.	<i>Lagena globosa</i> , W. and J.
" <i>angulosa</i> , Willd.	" <i>apiculata</i> , Reuss.
<i>Polymorphina lactea</i> , W. and J.	" <i>levis</i> , Montagu.
" <i>compressa</i> , d'Orb.	" <i>distoma</i> , P. and J.
<i>Cristellaria rotulata</i> , Lam.	" <i>sulcata</i> , P. and J.
" <i>lituus</i> , d'Orb.	" <i>semistriata</i> , Williamson.
" <i>crepidula</i> , F. and M.	" <i>striatopunctata</i> , P. and J.
* <i>Vaginulina spinigera</i> , Brady.	" <i>squamosa</i> , Montagu.
<i>Nodosaria</i> (<i>Dentalina</i>) <i>communis</i> , d'Orb.	" <i>melo</i> , d'Orb.
" " <i>puuperata</i> , d'Orb.	" <i>marginata</i> , W. and B.
" (<i>Glandulina</i>) <i>laevigata</i> , d'Orb.	" <i>ornata</i> , Willdenow.

Family *Textularidae*.

<i>Cassidulina laevigata</i> , d'Orb.	<i>Bulimina pyrula</i> , d'Orb.
" <i>crassa</i> , d'Orb.	<i>Valvulina conica</i> , P. and J.
<i>Bolivina punctata</i> , d'Orb.	<i>Verneuilina polystropha</i> , Reuss.
<i>Virgulina squamosa</i> , d'Orb.	<i>Spiroplecta biformis</i> , P. and J.
<i>Bulimina aculeata</i> , d'Orb.	<i>Textularia variabilis</i> , Willd.
" <i>elegantissima</i> , d'Orb.	" <i>agglutinans</i> , d'Orb.

Family *Lituolidae*.

<i>Trochammina inflata</i> , Mont.	<i>Haplophragmium cassis</i> , Parker.
<i>Ammodiscus incertus</i> , d'Orb.	<i>Reophax scorpiurus</i> , Montfort.
<i>Hippocrepina indivisa</i> , Parker.	" <i>findens</i> , Parker.
<i>Haplophragmium Canariense</i> , d'Orb.	

Family *Astrorhizidae*.

<i>Rhabdammina abyssorum</i> , M. Sars.	<i>Rhabdammina discreta</i> , Brady.
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Family *Miliolidae*.

<i>Cornuspira foliacea</i> , Philippi.	<i>Miliolina tricarinata</i> , d'Orb.
<i>Miliolina agglutinans</i> , d'Orb.	" <i>trigonula</i> , d'Orb.
" <i>Ferussacii</i> , d'Orb.	" <i>oblonga</i> , Mont.
" <i>bicornis</i> , W. and J.	" <i>seminulum</i> , L.
" <i>subrotunda</i> , Mont.	<i>Biloculina oblonga</i> , Mont.
" <i>secans</i> , d'Orb.	" <i>ringens</i> , Lam.

* Hans Kier, in his synopsis of the Norwegian Marine *Thalanophora* (Kristiania, 1900), says that this is a synonym of *Marginulina spinosa*, M. Sars, with which the writer had identified it in 1872.

RADIOLARIÆ.

Family *Dictyochidæ*.

DISTEPHANUS ACULEATUS (Ehrenberg).

Dictyocha aculeata, Ehrenberg (1839).*Distiphanus aculeatus*, Hæckel (1887)

Specimens that were referred to this species, with a query, by Sir J. W. Dawson (in his Handbook of Zoology, published in 1870) are said to have been "obtained from a depth of 313 fathoms in the Gulf of St. Lawrence by Captain Orlebar, R.N." Similar specimens have since been found by the writer in a sponge (*Halichondria panicea*) and in the stomach of the common sea urchin (*Strongylocentrotus drobachiensis*), both from very shallow water off Cap des Rosiers.

Three or four additional species of radiolarians are now known to occur in the Gulf of St. Lawrence, but they have not yet been critically studied.

PORIFERA (SPONGES)*

CALCAREA.

Family *Asconidæ*.

LEUCOSOLENIA CANCELLATA, Verrill.

1874. Proc. Am. Assoc. Adv. Sc. for 1873, p. 393.

Orphan Bank, off the entrance to the Baie des Chaleurs, 1873, Whiteaves (Verrill). Strait of Belle Isle, off Normans Light, 60 fathoms, rocky bottom, A. M. Rodger, 1892; Davis Strait, off Cape Raper, four miles south, 60 fathoms, bottom of stones and sand, A. M. Rodger, 1892, and at Cape Aston, in 60 fathoms, Captain Phillips, 1893 (Lambe).

Family *Sycettidæ*.

SYCON PROTECTUM, Lambe.

1896. Trans. Royal Soc. Canada, Second Series, vol. II., sec. iv., p. 204.

Gulf of St. Lawrence, eight miles south-east of Bonaventure Island, in 56 fathoms, stones and coarse sand, dredged by the writer in 1873. Strait of Belle Isle, off Norman's Light, 60 fathoms, rocky bottom, A. M. Rodger, 1892; and Upernavik, west coast of Greenland, 1892 (Lambe).

* Nearly all the sponges in this list have been identified or described and figured by Mr. L. M. Lambe; most of them in the Transactions of the Royal Society of Canada for 1896, Second Series, vol. II., sect. iv., pp. 181-211, plates i, ii and iii.

SYCON ASPERUM, Lambe.

1896. *Ibid.*, p. 205.

Gulf of St. Lawrence, off Bonaventure Island, in 56 fathoms, with the preceding species, collected by the writer in 1873.

Family *Grantiæ*.

GRANTIA CANADENSIS, Lambe.

1896. *Ibid.*, p. 206.

Northumberland Strait, between Pictou Island and Cape Bear, P.E.I., in 22 fathoms; Gulf of St. Lawrence, off Bonaventure Island, in 56 fathoms, dredged by the writer in 1873; and Métis, Sir J. W. Dawson (Lambe).

Family *Heteropiidae*.

HETEROPHIA RODGERI, Lambe.

1900. *Trans. Royal Soc. Canada, Second Series*, vol. vi., sect. iv., p. 35.

Strait of Belle Isle, off Norman's Light, 60 fathoms, rocky bottom, A. M. Rodger, 1892 (Lambe).

Family *Amphoriscidae*.

AMPHORISCUS THOMPSONI, Lambe.

1900. *Op. cit. supra.* p. 36.

Strait of Belle Isle, off Norman's Light, 60 fathoms, rocky bottom, A. M. Rodger, 1892 (Lambe).

DEMOSPONGIÆ.

TETRACTINELLIDÆ.

Family *Tetillidae*.

(CRANIELLA CRANIUM (Muller).

Richmond Gulf, Hudson Bay, from 20 to 30 fathoms, on a soft mud bottom, A. P. Low, 1899, (L. M. Lambe); east and west coasts of Greenland (Fristed). The *Tethea Logani* of Sir A. W. Dawson, which is so abundant in the Leda clay of the St. Lawrence and Ottawa valleys, would seem to be identical with this species).

Family *Theneidae*.

THENEA MURICATA (Bowerbank).

Gulf of St. Lawrence, between Anticosti and the Gaspé peninsula, in 220 fathoms dredged by the writer in 1873; east Greenland, in 250 fathoms, A. M. Rodger, 1894 (Lambe).

(MONAXONIDA).

HADROMERINA.

Family *Stylocordylidae*.

STYLOCORDYLA BOREALIS (Loven).

H. M. S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones. Dredged also by the writer in 1873, in the Gulf of St. Lawrence, about half way between Anticosti and the Gaspé peninsula, in from 200 to 220 fathoms mud, (about a dozen specimens).

Family *Clionidae*.

CLIONA CELATA, Grant.

North shore of Prince Edward Island, two specimens burrowing into oyster shells, collected by Dr. James Fletcher in 1893, and subsequently identified with this species by Mr. Lambe.

Family *Polymastiidae*.

POLYMASTIA ROBUSTA, Bowerbank.

H. M. S. Challenger, Station 49, (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones (Ridley & Dendy). Prince Edward Island, south of Cow Head, in 12 fathoms, seven pieces, all of which are part of one specimen, which formed a bright red thin crust, not far from a foot in its greatest diameter; collected by the writer in 1873, and since identified with this species by Mr. Lambe.

POLYMASTIA MAMILLARIS (Müller).

Gulf of St. Lawrence, dredged by the writer in 1871 and 1872 in deep water (120 to 210 fathoms) far from shore to the north and south of the Island of Anticosti.

TRICHOSTEMMA HEMISPHERICUM, M. Sars.

Gulf of St. Lawrence, between Anticosti and the north shore, eight miles from Charleton Point, Anticosti, in 112 fathoms, large and small stones, three specimens, dredged by the writer in 1871.

QUASILLINA BREVIS (Bowerbank).

H. M. S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms gravel and stones, fourteen specimens, all attached to pebbles by a stem or peduncle (Ridley and Dendy).

TENTORIUM SEMISUBERITES (Schmidt).

Thecaphora semisuberites, Schmidt (1870); and Whiteaves (1874).

Thecaphora ibla, Wyville Thompson (1873); and Whiteaves (1874).

Tentorium semisuberites, Vosmaer (1885).

H. M. S. Challenger, Station 49, 1873 (Ridley and Dendy). Gulf of St. Lawrence,—dredged by the writer in 1871, on the north shore, half way between Point des Monts and the west end of Trinity Bay, in 96 fathoms; in 1872, eight miles S.E. of Bonaventure Island, in 56 fathoms, and between Cape Gaspé and Cap des Rosiers, in 75 to 80 fathoms; also, in 1873, off Cap Bon Ami (near Ship Head, Gaspé), in 50 fathoms. Davis Strait, Erick Point bearing N.W. by W., 150 fathoms, rocky bottom, A. M. Rodger, 1892; and east Greenland, in 250 fathoms, A. M. Rodger, 1894 (Lambe).

Family *Suberitidae*.

SUBERITES FICUS (Johnston).

Sable Island, Nova Scotia, two specimens, one attached to the upper valve of a specimen of *Pecten Magellanicus*, and the other to the inside of a valve of a specimen of *Cyprina Islandica*, in the collection of Sir J. W. Dawson (Lambe).

SUBERITES HISPIDUS (Bowerbank).

Tetha hispida, Bowerbank (1864).

Suberites hispidus, Lambe (1897).

Gulf of St. Lawrence, twenty-four miles S. by W. of East Cape, Anticosti, in 212 fathoms, mud, one specimen, dredged by the writer in 1871.

(SUBERITES MONTALBIDUS, Carter.

Richmond Gulf, east coast of Hudson Bay, in from 20 to 30 fathoms, soft mud bottom, A. P. Low, 1899 (Lambe). Greenland (Fristedt.)

Family *Haploscleridae*.

CHALINA OCULATA (Pallas).

Five Islands, Minas Basin, Bay of Fundy, C. W. Willimot, 1892; Joggins, N.S., T. C. Weston, 1893; Nova Scotia and Rivière du Loup, Sir J. W. Dawson (Lambe). Gulf of St. Lawrence, collected by Dr. Bell in 1858.

HALICHONDRIA PANICEA, Johnston.

Common throughout the entire region, southward to New England and northward to Greenland. Macoun has collected it on the south coast of Prince Edward Island; the writer between Pictou Island, N.S., and Cape Bear, P.E.I., in 22 fathoms, and off Cap des Rosiers in 7 fathoms; Mr. W. B. Lambe between Grande Grève, Gaspé Bay and Ship Head (Cape Gaspé); and Sir J. W. Dawson at Rivière du Loup and Murray Bay.

RENIERA RUFESCENS, Lambe.

1893. Trans. Royal Soc. Canada for 1892, vol. x., sect. iv., p. 75.

Orphan Bank, off the entrance to the Baie des Chaleurs, one specimen, dredged by the writer in 1873; and Gaspé coast eight specimens, Sir J. W. Dawson (Lambe). The types of *R. rufescens* were collected at Petropaulowski, Kamtschatka, by Dr. G. M. Dawson in 1891.

RENIERA MOLLIS, Lambe.

1894. Idem, vol. xi., sect. iv., p. 26.

Orphan Bank, two fragments, dredged by the writer in 1873; coast of Labrador, one specimen, in Sir J. W. Dawson's collection; Wakeham Bay, Hudson Strait, A. P. Low, 1897; Davis Strait, Reef Coal Hill, bearing S.E., twenty miles, in 30 fathoms, rocky bottom,—and off Cape Raper, four miles south, in 60 fathoms, stones and sand, A. M. Rodger, 1892 (Lambe). The types of this species are from Vancouver Island.

EUMASTIA SITIENS, O. Schmidt.

Yarmouth, Nova Scotia, Professor Macoun, 1884; between Pictou Island, N.S. and Cape Bear, P.E.I., in 22 fathoms, dredged by the writer in 1873; Gaspé, Métis and Rivière du Loup, Sir J. W. Dawson (Lambe). Greenland (O. Schmidt, and Fristedt).

GELLIUS ARCOFERUS, Vosmaer.

Gulf of St. Lawrence, between Cape Gaspé and Cap des Rosiers, in 75 to 80 fathoms, stones, dredged by the writer in 1872 (Lambe). Greenland (Fristedt).

GELLIUS FLAGELLIFER, Riddle and Dendy.

Gulf of St. Lawrence, dredged by the writer between Cape Gaspé and Cap des Rosiers, five miles from shore, in 38 fathoms, small stones, in 1871; also at nearly the same locality, but in 75 to 80 fathoms, with the preceding species, in 1872 (Lambe).

GELLIUS LAURENTINUS, Lambe.

1901. Trans. Royal Soc. of Canada for 1900, Second Series, vol. vi., sect. iv., p. 20.

"Gulf of St. Lawrence, twenty miles N. by W. of St. Paul's Island, 100 fathoms, rocky bottom, A. M. Rodger, 4th of April, 1892, a fragment; Strait of Belle Isle, off Norman's Light, 60 fathoms, rocky bottom, A. M. Rodger, 9th of April, 1892, a fragment; Davis Strait, three miles from the mouth of Coutts Inlet, 130 fathoms, mud bottom, A. M. Rodger, 30th of July, 1892, two specimens, the largest of which is about 3 cent. broad and 1.5 thick, and part of a third that has grown around a worm tube" (Lambe).

Family *Peciloscleridae*.

ESPERELLA LINGUA (Bowerbank).

Hymeniacidon lingua, Bowerbank (1866).

Rhaphiodesma lingua, Bowerbank (1874).

Esperella lingua, Lambe (1897).

"Off Cap des Rosiers and Cape Gaspé, in 75 to 80 fathoms, stones, two specimens and some fragments, dry; also one specimen preserved in alcohol, J. F. Whiteaves, 1872. One specimen, dry, Gaspé, Sir William Dawson" (Lambe). North-east coast of the United States (Verrill); Greenland (Fristedt).

ESPERELLA MODESTA, Lambe.

1895. Trans. Royal Soc. Canada for 1894, vol. xii., sect. iv., p. 118.

"Gaspé coast, one specimen, dry, Sir William Dawson" (Lambe).

DESMACELLA PEACHII (Bowerbank), var. *GRONLANDICA*, Fristedt.

"Between Anticosti and the Gaspé peninsula, in 200 fathoms, one specimen, dry, J. F. Whiteaves, 1873. Fristedt's specimen from the east coast of Greenland was dredged in 130 fathoms" (Lambe).

CLADORHIZA ABYSSICOLA, M. Sars.

The specimen of this species that is figured by Mr. Lambe* was dredged by the writer in 1872, in the Gulf of St. Lawrence, about half way between the S.W. Point of Anticosti and the Gaspé peninsula, in 200 fathoms, mud.

CLADORHIZA GRANDIS, Verrill.

1879. Proc. U.S. Nat. Mus., vol. II., p. 204.

Deep water fishing grounds off Nova Scotia (Verrill).

CLADORHIZA NORDENSKIÖLDII, Fristedt.

"A portion of a sponge, evidently the root, which agrees perfectly in skeletal arrangement, as far as the specimen admits of comparison, and in the shape and size of the spicules, with Fristedt's specimen from the east coast of Greenland, was dredged by Mr. Whiteaves in 1873, between Anticosti and the Gaspé peninsula," in 200 fathoms, mud (Lambe). The St. Lawrence specimen is figured on Plate 1, figs. 9, a-f, of the second volume of the second series of Transactions of the Royal Society of Canada.

ARTEMISINA SUBERITOIDES, Vosmaer.

H. M. S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms gravel and stones (Ridley and Dendy).

DESMACIDON (*HOMÆODICTYA*) *PALMATA*, (Johnston).

"Nova Scotia, one specimen, and Sable Island one specimen, flabellate in form, dry, Sir William Dawson; Minas Basin, Bay of Fundy, twenty specimens and a number of fragments, dry, C. W. Willmot, 1892" (Lambe). North-east coast of the United States (Verrill).

IOPHON CHELIFER, Ridley and Dendy.

Gulf of St. Lawrence, twenty miles north by west of St. Paul's Island, 100 fathoms, rocky bottom, A. M. Rodger, 1892; Gaspé, Sir J. W. Dawson;

* On plate 1, fig. 8, of the second volume of the Second Series of Transactions of the Royal Society of Canada.

Eglinton Fjord, Davis Strait, Captain Phillips, 1893 ; Vancouver Island, Dr. G. M. Dawson (Lambe).

MYXILLA INCRUSTANS (Johnston).

Halichondria incrustans, Johnston (1842).

Myxilla incrustans, Lambe (1897).

Gaspé coast, two specimens, Sir J. W. Dawson (Lambe).

CLATHRIA DELICATA, Lambe.

1897. Trans. Royal Soc. of Canada for 1896, Second Series, vol. 11.,
sect. iv., p. 192.

" Prince Edward Island, one specimen, dry, attached to an oyster shell, Sir William Dawson ; Prince Edward Island, north shore, three specimens, growing on oyster shells, Dr. James Fletcher " ; " Portland, Maine " (Lambe).

Family *Axinellidae*.

PHAKELLIA VENTILABRUM (Johnston).

Halichondria ventilabrum, Johnston (1842).

Phakellia ventilabrum, Bowerbank (1864).

Gulf of St. Lawrence, eight miles south-east of Bonaventure Island, in 56 fathoms, stones and coarse sand, four specimens, dredged by the writer in 1872 ; Gaspé coast, Métis, Rivière du Loup and Murray Bay, Sir J. W. Dawson ; west coast of Hudson Bay at York Factory, and between York Factory and Fort Severn, Dr. R. Bell, 1880 ; east coast of Hudson Bay, near Great Whale River, A. P. Low, 1896 ; Davis Strait, A. M. Rodger, 1892 (Lambe).

COELENTERATA.

HYDROMEDUSÆ.

ANTHOMEDUSÆ.

Family *Clavidae*.

CLAVA LEPTOSTYLA, Agassiz.

Clava multicornis, Stimpson (1853) non Johnston. Fide Verrill.

Salmon Bay (on the north shore of the Gulf of St. Lawrence, just inside of the Strait of Belle Isle), on shells, in 10 to 20 fathoms (Packard). Long Island Sound to Labrador (Verrill).

Family *Corynidæ*.

SYNCORYNE MIRABILIS (L. Agassiz).

Sarsia mirabilis, L. Agassiz (1849).*Coryne gravata*, Wright (1858).*Coryne mirabilis*, L. Agassiz (1860).*Syncoryne gravata*, Hincks (1868).*Syncoryne mirabilis*, Allman (1871-72).

Bay of Fundy (Verrill). "This species, just in the act of throwing off the Medusæ, was dredged in great abundance on June 24th" (1864) "at Belles Amours, Strait of Belle Isle, where the hydraria were found attached to *Ptilota elegans*, growing on a clean gravelly bottom" (Packard).

Family *Bougainvillidæ*.

DICORYNE FLEXUOSA, G. O. Sars.

"Numerous specimens of this interesting hydroid were dredged both this year (1878) and last (1877) in many localities in the Gulf of Maine and off Nova Scotia, in 50 to 125 fathoms. It grows usually upon the shells of living *Neptunea Stimpsoni* and *N. decemcostata*, sometimes also on shells inhabited by *Eupaguri*. Often associated with *Eudendrium rameum*" (Verrill, in American Journal of Science and Arts for November, 1878, p. 375).

Family *Eudendriidæ*.

EUDENDRIUM RAMOSUM (L.).

Tubularia ramosa, L. (1767).*Eudendrium ramosum*, Ehrenberg (1834); et auct.

Bay of Fundy, in 6 to 100 fathoms (Verrill). Gulf of St Lawrence, dredged by the writer in 1873, eight miles S. E. of Bonaventure Island, in 56 fathoms, with atrophied fertile polypites, and identified by Professor Verrill. Collected at Métis and Murray Bay by Miss Cary, and identified by Sir J. W. Dawson in 1858 (Canadian Naturalist and Geologist, vol. III, p. 407).

EUDENDRIUM RAMEUM, (Pallas).

Tubularia ranca, Pallas (1766).*Eudendrium rameum*, Johnston.

"Colour in life, light purplish red above, yellow beneath." Dredged by the SS. Speedwell of the U. S. Fish Commission in 1887, "about thirty miles south from Halifax, N.S., in 100 fathoms, fine compact sandy mud, associated with *Archaster arcticus*", A. Florø, "*Astrogonium granulare*, *Asterias stellonura*, *Hippasteria phrygiana*, *Antedon Eschrichtii*," &c. (Verrill).

EUDENDRIUM CAPILLARE, Alder.

Le Have Bank, Nova Scotia, 45 fathoms, gravelly and stony bottom,
U. S. Fish Commission, 1872 (Smith and Harger).

EUDENDRIUM CINGULATUM, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 9.

Grand Manan, dredged in 20 fathoms, on a shelly bottom off Duck
Island (Stimpson).

EUDENDRIUM DISPAR, Agassiz.

Vineyard Sound to Bay of Fundy, 1 to 20 fathoms (Verrill, 1873).

EUDENDRIUM TENUE, Agassiz.

Buzzards Bay to Bay of Fundy, low water to 15 fathoms (Verrill, 1873).

Family *Tubularidae*.

TUBULARIA INDIVISA (L.)

Recorded by Dr. Stimpson, but with a query, as occurring at Grand
Manan, "chiefly in the laminarian zone." "Of large size at Sable Island,
Nova Scotia, collected by Willis" (Sir J. W. Dawson). Le Have Bank,
Nova Scotia, in 45 fathoms, U. S. Fish Commission, 1872 (Smith and
Harger).

THAMNOCNIDIA LARYNX (L.)

Tubularia larynx (Ellis) Stimpson (1853).

Thamnocnidia larynx, Verrill (1879).

Grand Manan, "dredged in 25 fathoms, on the Hake Ground"; Stimpson.
Attached to fronds of *Laminaria* on the Orphan Bank (Whiteaves, 1873);
alive in great numbers in Gaspé Bay (Sir J. W. Dawson, 1858).

THAMNOCNIDIA TENELLA, Agassiz.

Common in Casco Bay and the Bay of Fundy, low water to 40 fathoms
(Verrill).

Family *Myriothele*.

MYRIOTHELA PHRYGIA (Fabricius).

Lucernaria phrygia, Fabricius (1780).

Myriothele phrygia, M. Sars (1849).

"Grand Manan, Bay of Fundy, W. Stimpson" (L. Agassiz).

Family *Hydractiniidæ*.

HYDRACTINIA ECHINATA, Johnston.

Hydractinia polyclina, L. Agassiz (1860).

New Jersey to Labrador (Verrill). Throughout the entire region, from low-water mark to 60 fathoms, usually coating over the dead shells of gasteropoda.

Family *Monocaulidæ*.

MONOCAULUS GLACIALIS (M. Sars).

Corymorpha glacialis, M. Sars (1849).*Corymorpha nutans*, Stimpson (1853).*Corymorpha pendula*, L. Agassiz (1862).*Monocaulus glacialis*, Allman (1864).

Grand Manan, "off West Quoddy Head, a hundred or more were taken at a single haul of the dredge. It also occurs at Welsh Pool and near Low Duck Island. It lives on a sandy bottom, in from 4 to 15 fathoms" (Stimpson). Common in Casco Bay and the Bay of Fundy (Verrill). Rodger's Island, Oak Bay, Charlotte County, N.B., at a very low tide clinging to the woodwork of a weir (Ganong, 1889). Murray Bay, Sir J. W. Dawson, (fide Verrill).

Incertæ Sedis.

ACAULIS PRIMARIUS, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 10.

Grand Manan, "dredged in the laminarian zone, from 5 to 15 fathoms, attached to various Rhodosperms, as *Ptilota*, *Chondrus* and *Rhodymenia*" (Stimpson).

LEPTOMEDUSÆ.

(a.) Medusoid Scheme.

Family *Cannotidæ*.

PTYCHOGENA LACTEA, A. Agassiz.

Around Pendleton's Island, east side of Passamaquoddy Bay (Ganong).

Family *Eucopidæ*.

TIAROPSIS DIADEMATA, L. Agassiz.

Bay of Fundy (Verrill).

PHIALIDIUM LANGUIDUM (L. Agassiz).

Oceania languida, L. Agassiz.*Phialidium languidum*, Hæckel.

Bay of Fundy (Verrill).

Family *Æquoridae*.

POLYCANNA GRÆNLANDICA (Peron and Lesueur).

Medusa æquorea, O. Fabricius (1780).*Æquorea Grænlantica*, Peron and Lesueur (1809).*Zygodactyla Grænlantica*, L. Agassiz (1862).*Polycanna Grænlantica*, Hæckel.

Buzzards Bay to Greenland (Verrill).

(b.) Hydroid Scheme.

Family *Campanularidae*.

CAMPANULARIA VOLUBILIS (Pallas).

Sertularia volubilis, Pallas (1766).*Campanularia volubilis*, Alder (1857); not of Johnston.

"Common in the Bay of Fundy, low water to 60 fathoms" (Verrill). Gulf of St. Lawrence, off Cap des Rosiers lighthouse, in 7 fathoms (Whiteaves).

CAMPANULARIA FLEXUOSA, Hincks.

Laomedea flexuosa, Hincks (1861).*Laomedea amphora*, L. Agassiz (1862).*Campanularia flexuosa*, Hincks (1863).

"Long Island Sound to Gulf of St. Lawrence"; "Bay of Fundy to Gulf of St. Lawrence" (Verrill).

CAMPANULARIA HINCKSI, Alder.

Le Have Bank, Nova Scotia, in 45 fathoms, gravelly and stony bottom U. S. Fish Commission, 1872 (Smith and Harger).

CAMPANULARIA VERTICILLATA (L.)

Dredged by Messrs. Smith and Harger on the Le Have Bank, in 45 fathoms, and by Dr. A. S. Packard and the writer at many localities in the Gulf of St. Lawrence, in from about 20 to 50 fathoms or more.

CAMPANULARIA CALICULATA, Hincks.

Campanularia caliculata, Hincks (1853).

Clytia (*Orthopyxis*) *poterium*, L. Agassiz (1862).

Orthopyxis poterium, A. Agassiz (1865).

Orthopyxis caliculata, Verrill (1873).

Bay of Fundy, low-water to 30 fathoms, and Gulf of St. Lawrence, at the Mingan Islands, in 6 fathoms; also Henley Harbour, Strait of Belle Isle, 20 to 30 fathoms, Packard, as *Clytia volubilis* (Verrill).

OBELIA GELATINOSA (Pallas).

South shore of the St. Lawrence at Métis, collected by Miss Carey, and identified by Sir J. W. Dawson in 1858; near Caribou Island (Packard).

OBELIA COMMISSURALIS, McCready.

(?) *Laomedea gelatinosa*, Stimpson (non Pallas).

"Grand Manan, Mills, t. A. Agassiz" (Verrill).

OBELIA LONGISSIMA (Pallas).

Bay of Fundy (Verrill).

OBELIA DICHOTOMA (L).

Nova Scotia, and south shore of the St. Lawrence at Métis (Sir J. W. Dawson, 1858).

OBELIA PYRIFORMIS, Verrill.

"Long Island Sound to Bay of Fundy" (Verrill).

OBELIA GENICULATA (L).

Sertularia geniculata, L. (1758).

Eucope diaphana (pars) L. Agassiz (1862).

Obelia geniculata, Allman (1864); teste Hincks.

Eucope alternata, A. Agassiz (1865).

"Long Island Sound to Labrador;" "Bay of Fundy and northward, low-water to 40 fathoms, on *Laminaria*, *Rhodymenia*, etc." (Verrill). *O. geniculata*, "or a similar species, is very common on sea weeds in the Gulf of St. Lawrence" (Sir J. W. Dawson, 1858).

CALYCELLA SYRINGA (L).

Grand Manan, "on *Sertularia polyzonias* in 25 fathoms off Duck Island" Stimpson, as *Campanularia syringa*, Lamarck). Le Have Bank, Nova

Scotia, U. S. Fish Commission, 1872 (Smith and Harger). Gulf of St. Lawrence, on the Orphan Bank, and about half way between East Cape, Anticosti, and the Bird Rocks, in 313 fathoms, Whiteaves (Verrill).

CLYTIA JOHNSTONI (Alder).

Campanularia Johnstoni, Alder (1857).

Clytia bicophora, L. Agassiz (1862).

Clytia volubilis, A. Agassiz (1865); non Lamouroux, fide Verrill.

Clytia Johnstoni, Hincks (1868).

"Long Island Sound to the Arctic Ocean;" "abundant in Casco Bay and Bay of Fundy, low-water to 40 fathoms" (Verrill). Le Have Bank, Nova Scotia, in 45 fathoms (Smith and Harger). Orphan Bank, Whiteaves (Verrill).

Family *Perisphorida*.

LAFOEA DUMOSA (Fleming).

Nova Scotia (L. Agassiz).

LAFOEA GRACILLIMA (Alder).

Lafoea fruticosa, Hincks (1868).

Lafoea gracillima, G. O. Sars (1873).

Bay of Fundy (Verrill); Le Have Bank, N.S., in 45 and 60 fathoms (Smith and Harger).

LAFOEA ROBUSTA, Verrill.

Halecium robustum, Verrill (1873).

Lafoea robusta, Verrill (1879).

About half way between Anticosti and the Gaspé peninsula, in from 120 to 200 fathoms; dredged by the writer in 1873, and since identified with this species by Professor Verrill.

CUSPIDELLA GRANDIS, Hincks.

Orphan Bank, Whiteaves (Verrill); Cateau Harbour, Long Island, Labrador, 15 fathoms, not common, A. S. Packard (as *Lafoea dumosa*, fide Verrill).

Family *Haleciidae*.

HALECIUM HALECINUM (L.)

Dredged at many localities in the Gulf of St. Lawrence, at moderate depths, by Packard, Sir J. W. Dawson, the writer and others, also in the

Strait of Belle Isle (at Chateau Bay, in 30 fathoms on a sandy bottom) by Packard.

HALECIUM MURICATUM (Ellis and Solander).

Fifteen miles S.S.E. of Bonaventure Island, in 50 fathoms, stony and rocky bottom, dredged by the writer in 1872. Off Caribou Island, P.Q., on a fishing bank in from 30 to 50 fathoms; and Square Island, Labrador, in 30 fathoms (Packard).

HALECIUM SESSILE, Norman.

Between East Cape, Anticosti and the Bird Rocks, in 212 fathoms; two specimens, dredged by the writer in 1871 and since determined by Professor Verrill.

Family *Sertulariadae*.

SERTULARIA ABIETINA, L.

H. M. S. Challenger, Station 48 (May 8, 1873) off Nova Scotia, in 51 fathoms, rock (Allman). "Mingan Island, Gulf of St. Lawrence, and Labrador. 'Anticosti Expedition'", Verrill (Packard). Apparently abundant also in Sir J. W. Dawson's and the writer's dredgings in the Gulf and mouth of the River St. Lawrence.

SERTULARIA FILICULA, Ellis and Solander.

Grand Manan, dredged in 20 fathoms, on shelly bottoms (Stimpson). Labrador (Packard).

SERTULARIA PUMILA, L.

Nova Scotia (on sunken logs) and Métis (Sir J. W. Dawson); Strait of Belle Isle, between tides, abundant (Packard).

SERTULARIA POLYZONIAS, L., and var. *GIGANTEA*, Hincks.

Grand Manan, in from 10 to 40 fathoms (Stimpson); Le Have Bank, N.S., in 45 and 60 fathoms, the var. *gigantea*, U. S. Fish Commission, 1872 (Smith and Harger). Dredged at many localities in the Gulf of St. Lawrence, by the writer. "Between tides at Caribou Island, and in deeper water, where it grows very stout and large" (Packard).

SERTULARIA RUGOSA, L.

Grand Manan, common in deep water (Stimpson). Common in the Gulf of St. Lawrence. "Rarely met with in 30 fathoms at Square Island," Labrador (Packard).

SERTULARIA TRICUSPIDATA, Alder.

Bay of Fundy, 50-55 fathoms (Verrill); Le Have Bank, N.S., in 45 and 60 fathoms (Smith and Harger). Very common at many localities in the Gulf of St. Lawrence, at moderate depths (Whiteaves). "Abundant in the Strait of Belle Isle in 40 fathoms, upon *Diphasia rosacea*" (Packard).

SERTULARIA FUSIFORMIS, Hincks.

Gulf of St. Lawrence, about half way between Anticosti and the Gaspé peninsula, in 200 fathoms, on *Campanularia verticillata*, dredged by the writer in 1873, and subsequently determined by Professor Verrill.

SERTULARIA LATIUSCULA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 8.

Grand Manan, "dredged in the laminarian zone" (Stimpson).

SERTULARIA PRODUCTA, Stimpson.

1853. Op. cit., p. 8.

Grand Manan (Stimpson).

DIPHASIA FALLAX (Johnston).

Sertularia fallax, Johnston (1847).

Diphasia fallax, L. Agassiz (1862).

Grand Manan (Stimpson); Bay of Fundy, 20-55 fathoms (Verrill).

DIPHASIA ROSACEA (L.)

Sertularia rosacea, L. (1767).

Diphasia rosacea, L. Agassiz (1862).

"Very abundant in 50 fathoms, gravelly bottom, in the Strait of Belle Isle" (Packard).

DIPHASIA MIRABILIS, Verrill.

1872. Trans. Conn. Acad. Arts and Sc., vol. III., p. 53.

Le Have Bank, N.S., in 60 fathoms (Smith and Harger).

THUIARIA THUJA (L.)

Collected by Messrs. Hyatt, Shaler and Verrill, on the Cambridge expedition to Anticosti in 1861, at the Mingan Islands, Gulf of St. Law.

rence (Packard); and since dredged at several localities in the Gulf by the writer and others.

THUIARIA ARTICULATA (Pallas).

Le Have Bank, N.S., in 45 fathoms (Smith and Harger); Gulf of St. Lawrence (Whiteaves).

THUIARIA CUPRESSINA (L.)

Sertularia cupressina (L.) Gmelin (1792).

Thuiaria cupressina, Allman (1888).

H. M. S. Challenger, Station 48 (May 8, 1873) off Nova Scotia, in 51 fathoms, rock (Allman). Bay of Fundy, in tide pools and from 1 to 100 fathoms, common (Verrill). Northumberland Strait and Gulf of St. Lawrence (Whiteaves); Henley Harbour (Strait of Belle Isle) in 7 fathoms (Packard).

THUIARIA ARGENTEA (Ellis and Solander).

Sertularia argentea, Ellis and Solander (1786).

Thuiaria argentea, Allman (1888).

Grand Manan, "common in 4 to 6 fathoms, attached to stones" (Stimpson). "Bay of Fundy; Nova Scotia coast; Gulf of St. Lawrence, low-water to 110 fathoms (Verrill). Northumberland Strait and Gulf of St. Lawrence (Whiteaves); Gaspé Bay, attached to shells of *Pecten Magellanicus*" (Sir J. W. Dawson); Caribou Island, in 8 fathoms, not common (Packard).

HYDRALLMANIA FALCATA (L.)

Sertularia falcata, L. (1758).

Plumularia falcata, Stimpson (1853).

Plumularia tenerrima, Stimpson (1853); vide Verrill.

Hydrallmania falcata, Hincks (1868).

Grand Manan, "taken often in 35 fathoms in the Hake Ground" (*P. falcata*) and "common in 25 fathoms, shelly bottom, off the northern point of Duck Island" (*P. tenerrima*); Stimpson. "Very abundant in Casco Bay and the Bay of Fundy, low-water to 110 fathoms" (Verrill). Le Have Bank, N.S., in 60 fathoms; and off Chebucto Head, Halifax Harbour, in 20 fathoms (Smith and Harger); Sable Island, N.S., Gaspé and Métis (Sir J. W. Dawson); Anticosti and the Mingan Islands (Verrill). Dredged by the writer also at many localities in the Gulf of St. Lawrence, and apparently common throughout the entire region.

Family *Grammaridæ*.

GRAMMARIA ABIETINA, M. Sars.

Grammaria robusta, Stimpson (1853); fide Verrill.

Grand Manan, "dredged not unfrequently in the laminarian zone" (Stimpson). Le Have Bank, N.S., in 60 fathoms (Smith and Harger). Gulf of St. Lawrence, at Trinity Bay, on the north shore, in 25 fathoms, and elsewhere, very common (Whiteaves).

GRAMMARIA GRACILIS, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 9.

Grand Manan, "one specimen only was taken, which occurred in the laminarian zone" (Stimpson).

Family *Aglaophenidæ*.

THECOCARPUS MYRIOPHYLLUM (L.)

Sertularia myriophyllum, L. (1767).

Aglaophenia myriophyllum, Lamouroux (1816).

Lytocarpus myriophyllum, Allman (1883).

Thecocarpus myriophyllum, Nutting (1900).

Le Have Bank, N.S., in 60 fathoms (Smith and Harger). Gulf of St. Lawrence, six miles E.N.E. of Cape Gaspé, in 30 fathoms, stones and coarse sand (Whiteaves); Mingan Islands (A. Agassiz).

CLADOCARPUS POURTALESII, Verrill.

1879. Amer. Journ. Sc. and Arts, Third Series, vol. xvii., p. 309.

"South-west from Cape Sable, N.S., 112-115 fathoms, gravel," 1877, U. S. Fish Commission. "Also taken on Banquereau, N.S., in 300 fathoms, by the crew of the schooner Magic, Capt. W. Thompson" (Verrill).

CLADOCARPUS SPECIOSUS, Verrill.

1879. Ibid., p. 311.

"Banquereau, off Sable Island, N.S., in about 200 fathoms." Obtained by the crew of the schooner Marion, Capt. J. W. Collins, Sept. 12, 1878, and preserved by Mr. Newcomb (Verrill).

AGLAOPHENOPSIS CORNUTA (Verrill).

Cladocarpus cornutus, Verrill (1879).

Aglaophenopsis cornuta, Nutting (1900).

Off Sable Island, N.S., on Banquereau, in about 200 fathoms, with the preceding species.

Family *Plumulariidae*.

ANTENNULARIA ANTENNINA (L.)

Sertularia antennina, L. (1758).*Antennularia antennina*, Fleming, (1822).

"Martha's Vineyard to Bay of Fundy;" "Bay of Fundy, 10 to 60 fathoms, not uncommon" (Verrill).

TRACHOMEDUSÆ.

Family *Trachynemidae*.

TRACHYNEME DIGITALE (O. Fabricius).

Medusa digitale, O. Fabricius (1780).*Trachynema digitale*, A. Agassiz (1865).

Vineyard Sound to Greenland (Verrill). "Specimens, agreeing well with Mr. A. Agassiz's figures and description, and of a beautiful sherry tint, were dredged in 15 fathoms, rocky bottom, near Strawberry Harbour" (Labrador), "and at another point on the coast, southward" (Packard).

SIPHONOPHORA.

Family *Physaliidae*.

PHYSALIA PELAGICA, Lamarck. "PORTUGUESE MAN OF WAR."

Physalia arcthusa, Tilesius.

"Occasionally found on the coast of Nova Scotia" (Sir J. W. Dawson, Hand Book of Zoology, 1870, p. 81). "Inside the Rippings, Grand Manan" (Dr. J. W. Fewkes, 1889).

SCYPHOMEDUSÆ.

STAUROMEDUSÆ.

Family *Lucernariidae*.

LUCERNARIA QUADRICORNIS, Muller.

Grand Manan, "dredged on a bottom of nullipores and sea-collanders (*Agarum*) in 4 fathoms" (Stimpson). Gulf of St. Lawrence, at Caribou Island, in 10 fathoms sand, dredged by Dr. A. S. Packard in 1860 and identified by Professor H. J. Clark.

HALYCLYSTUS AURICULA, Clark.

"Very abundant on *Chorda filum*, at low-water, August 14th" (1861), Anticosti, S. W. Point. "Anticosti Expedition." Verrill (Packard).

MANANIA AURICULA, Clark.

Lucernaria auricula, Fabricius (non Møller).*Manania auricula*, Clark.

Cited as "not common" in Packard's "View of the Recent Invertebrate Fauna of Labrador," but no exact localities are mentioned at which it occurs.

DISCOMEDUSÆ.

Family *Cyaneidæ*.

CYANEA ARCTICA, Peron and Lesueur.

Medusa capitata, Fabricius (1780); fide L. Agassiz.*Cyanea arctica*, Peron and Lesueur (1809).*Cyanea Postelsii*, Gould (1841).

The common large, claret, red, or liver-coloured jelly fish of the Gulf of St. Lawrence, which ranges from Long Island Sound to Greenland. It is known to occur in the Bay of Fundy, on the Atlantic coast of Nova Scotia, throughout the Gulf of St. Lawrence, and in the Strait of Belle Isle.

Family *Ulmaridæ*.

AURELIA FLAVIDULA, Peron and Lesueur.

Medusa aurita, Fabricius (1780).*Aurelia flavidula*, Peron and Lesueur (1809).*Aurelia aurita*, Stimpson (1853).

Floating at or near the surface, almost everywhere in the region under consideration. Stimpson and Verrill have found it in the Bay of Fundy; Ganong in Passamaquoddy Bay; Sir J. W. Dawson, Verrill, the writer and others, at various localities in the Gulf of St. Lawrence; Packard in the Strait of Belle Isle; and Fabricius off the coast of Greenland.

ALCYONARIA.

ANTHOZOA.

STOLONIFERA.

Family *Cornulariidae*.

CORNULARIELLA MODESTA, Verrill.

1874. Amer. Journ. Sc. and Arts, Third Series, vol. VII., p. 40.

Bay of Fundy, 80 to 100 fathoms (Verrill, 1874). Off Cape Sable, N.S., 80 fathoms, Albatross dredgings, 1883 (Verrill). Dredged by the writer, in 1871, in the Gulf of St. Lawrence, between East Cape, Anticosti, and the Bird Rocks, in 220 fathoms.

ALCYONACEA.

Family *Alcyonidae*.

ALCYONIUM RUBIFORME (Ehrenberg).

Lobularia rubiforme, Ehrenberg (1834).*Alcyonium rubiforme*, Dana (1846).

Dredged by the writer off Grande Grève, Gaspé Bay, in 1867; at many localities in the Gulf of St. Lawrence north of the Baie des Chaleurs in 1871, 1872 and 1873; and on the Orphan Bank, where it was very abundant, in 1873.

ALCYONIUM CARNEUM, L. Agassiz.

Halcyonium carneum, L. Agassiz (1850).*Alcyonium digitatum*, Stimpson (1853); non L.

Grand Manan, "found attached to small pebbles on shelly bottoms in 10-39 fathoms. All the specimens obtained were very small, the largest scarcely an inch in length, and not divided into lobes" (Stimpson). "In Chedabucto Bay, on the southern side of Breton Island, we" (i. e. Messrs. Hyatt, Shaler and Verrill): "observed an abundance of *Alcyonium carneum*, Ag. (in 1861) in 10 fathoms rocky bottom, associated with a variety of hydroids. This is the most northern locality yet known for the species, its range being southward to Cape Cod" (Verrill, in Canadian Naturalist and Geologist for December, 1863, vol. VIII., p. 421). Bay of Fundy and coast of Nova Scotia, low-water to 80 fathoms (Verrill, 1873). Very fine and frequent between Cape Breton and Prince Edward islands, where it was dredged at several localities by the writer in 1873.

ALCYONIUM MULTIFLORUM, Verrill.

1879. Proc. U. S. Nat. Mus., vol. II., p. 200.

Off Nova Scotia, in 131-239 fathoms, SS. Albatross, of the U. S. Fish Commission, 1883 (Verrill).

ANTHOMASTUS GRANDIFLORUS, Verrill.

1878. Amer. Journ. Sc. and Arts, Third Series, vol. XVI., p. 376.

Off Sable Island, N.S., in about 250 fathoms, schooner Marion, two specimens" (Verrill, 1878). "The Gloucester fishermen first collected this species on the deep-water fishing banks off Nova Scotia, in 1877 and 1878." Since that time they have brought in numerous specimens and presented them to the U. S. Fish Commission. "These have come from Georges Bank, Le Have Bank, Banquereau, Sable Island Bank, Grand Bank, etc., in 150 to 300 fathoms" (Verrill, 1883).

Family *Nephthyidae*.

EUNEPHYA LUTKENI (Marenzeller).

Alcyonium glomeratum, Lutken, M.S. (non Johnston).*Eunephytha glomerata*, Verrill (1860).*Annothea Lutkeni*, Marenzeller (1878).*Alcyonium Lutkeni*, Verrill (1879).

"Several specimens of a species agreeing perfectly with Greenland specimens sent to me under the" M.S. name *Alcyonium glomeratum*, "by Dr. Chr. Lutken, were dredged in 52 fathoms, off Halifax, N.S., by the U. S. Fish Commission, in 1877" (Verrill, 1879). "Several good specimens have been obtained and presented to the U. S. Fish Commission by the Gloucester fishermen, from the deep-fishing banks off Nova Scotia" (Verrill, 1883).

PSEUDAXONIA.

Family *Briareidae*.

ANTHOTHELA GRANDIFLORA (Sars).

Briareum grandiflorum, Sars.*Anthothela grandiflora*, Verrill (1879).

"This species has been obtained in several instances by the Gloucester halibut fishermen, in deep water, off Nova Scotia, and presented to the U. S. Fish Commission." "It was first obtained by Capt. N. McPhee and crew, of the schooner Carl Schurz, off Sable Island" (Verrill).

PARAGORGIA ARBOREA (L.).

Alcyonium arborescens, L. (1758).*Briareum arborescens*, Dana (1846).*Paragorgia arborea*, Edwards and Haimé (1837).

Bay of Fundy, Dr. W. Wood (Verrill, 1864). Abundant in deep water off Nova Scotia (Verrill, 1878, Canadian Naturalist, Second Series, vol. VIII., p. 476).

AXIFERA.

Family *Isidæ*.

CERATOISIS ORNATA, Verrill.

Keratoisis ornata, Verrill (1878).*Ceratoisis ornata*, Verrill (1883).

"Two specimens were taken by Mr. Philip Merchant, of the schooner Marion, off Sable Island, N.S., in about 250 fathoms, on a trawl line"

(Verrill, 1878). Several other specimens have subsequently been obtained by other vessels of the Gloucester fishing fleet, from the banks of Nova Scotia, where it occurs in 200 to 300 fathoms (Verrill, 1883).

ACANELLA NORMANI, Verrill.

Acanella arbuscula, Norman (1876); non Johnston (1862) fide Verrill.
Acanella Normani, Verrill (1878).

"Two fine specimens of this elegant species were obtained by Mr. Merchant" off Sable Island "with the preceding species." "A third specimen was brought in by Mr. M. J. Murphy, from Banquereau, in the same region. "The species was first described by Norman from a specimen collected off the coast of Greenland, in 410 fathoms, by the Valorous Expedition, in 1875," (Verrill, 1878). "It has been brought in in considerable numbers and in many lots, from the deep fishing grounds off Newfoundland and Nova Scotia, by the Gloucester halibut fishermen" (Verrill, 1883).

Family *Primnoide*.

PRIMNOA RESEDA (Pallas).

Gorgonia reseda, Pallas.
Gorgonia lepadifera, L. (1758).
Primnoa lepadifera, Lamouroux, 1816; et auct.
Primnoa reseda, Verrill (1864).

Mouth of the Bay of Fundy, in deep water (Verrill, 1864). "Fine specimens of *Primnoa reseda* and *Paragorgia arborea* are often taken in the same region from which *Ceratoisis ornata* and *Acanella Normani* were obtained, (i.e., off Sable Island) as well as from the depression between St. George's and Le Have banks in 100 to 200 fathoms. One of the specimens of *Paragorgia* presented to us is over three feet high, and some of *Primnoa* are nearly as tall" (Verrill, 1878). "On the outside of Brown's Bank, off southern Nova Scotia, at several stations" in 1883, "the Albatross dredged in 101 to 131 fathoms, a number of good specimens of the great bush-coral, *Primnoa lepadifera*, thus accurately fixing one of its localities" (Verrill, 1885). The species has also been recently found in the North Pacific, on the coast of British Columbia.

Family *Muriceida*.

ACANTHOGORGIA ARMATA, Verrill.

1878. Amer. Journ. Sc. and Arts, Third Series, vol. xvi., p. 376.

"Several fine specimens have been brought from the deep fishing banks off Nova Scotia and Newfoundland by the Gloucester fishermen, during the past four years, and presented to the U. S. Fish Commission. "The

first specimen was taken off Nova Scotia, in 300 fathoms, by Captain T. Goodwin, schooner *Elisha Crowell* " (Verrill, 1883).

PARAMURICEA BORNEALIS, Verrill.

1878. Ibid, p. 213.

"A number of specimens have been obtained by the Gloucester fishermen, from the fishing banks off Nova Scotia, in deep water" (Verrill, 1883).

PARAMURICEA GRANDIS, Verrill.

1883. Bull. Mus. Comp. Zool., vol. XI., p. 37.

"Several fine examples, some of them of large size, have been brought from the fishing banks off Nova Scotia by the Gloucester fishermen, and presented to the U. S. Fish Commission" (Verrill, 1883).

STELECHOTOKEA.

Family *Anthoptilidae*.

ANTHOPTILUM GRANDIFLORUM, Verrill.

Virgularia grandiflora, Verrill (1879).

Anthoptilum grandiflorum, Verrill (1882).

Grand Bank, Western Bank, Banquereau, Sable Island Bank and Le Have Bank, taken by Gloucester fishermen and presented to the U. S. Fish Commission (Verrill, 1882 and 1883). Common off Nova Scotia (Verrill, 1885).

(*A. Murrayi*, Kolliker, was described from specimens dredged by H.M.S. Challenger, at Station 50, off Nova Scotia, in 1,250 fathoms, just outside of the area included within the limits of this paper.)

FUNICULINA ARMATA, Verrill.

1878. Amer. Journ. Sc. and Arts, Third Series, vol. XVII., p. 240.

"Taken on a trawl line in 300 to 400 fathoms, about forty miles southwest from the N.W. light of Sable Island, N.S., by George K. Allen, schooner M. H. Perkins (Verrill, 1879). "Other specimens were afterwards brought in by the Gloucester fishermen from the fishing banks off Nova Scotia" (Verrill, 1883).

Family *Virgularidae*.

VIRGULARIA LYUNGMANI, Kolliker.

Gulf of St. Lawrence, thirty miles N.E. of Cap des Rosiers, in 200 fathoms mud; fifteen living specimens, which were dredged by the writer in 1872, and identified with this species by Professor Verrill.

BALTEICINA FINMARCHICA (Sars).

Virgularia Finmarchica, M. Sars (1856).*Balticina Finmarchica*, Gray; and Verrill (1878).

"Between Sable Island and Banquereau, N.S., taken on a trawl line, with *Pennatula borealis*" (Verrill, 1878). "Since received from the Gloucester fishermen from the outer slopes of the Grand Bank and from all the banks off the Nova Scotia coast in 60 to 100 fathoms" (Verrill, 1882).

Family Pennatulidæ.

PENNATULA ACULEATA, Danielssen.

Pennatula aculeata, Danielssen (1858).*Pennatula phosphorea*, var. *aculeata*, Sars (1870).*Pennatula Canadensis*, Whiteaves (1872).

Dredged by the SS. Speedwell of the U.S. Fish Commission, in 1877, about thirty miles south from Halifax, N.S., in 100 fathoms, fine, compact sandy mud (Verrill). "Grand Bank, St. Peter's Bank, Banquereau, Western Bank, and other banks off Nova Scotia, in 60 to 300 fathoms" (Verrill, 1882).

The same species had previously been dredged by the writer in 1871, 1872 and 1873, in abundance, living in the deep sea mud (from 160 to 200 fathoms) in the Gulf of St. Lawrence about half way between the Island of Anticosti and the Gaspé peninsula. By far the larger number of examples obtained in 1872 were cut in two transversely, at about the midlength, by the scraper of the dredge, so that only the upper and polypiferous halves of the specimens were found in the bag. This strengthens the idea that these sea-pens live with the naked portion of the stem buried in the deep sea mud. When living they are of a beautiful dark red or carmine colour.

PENNATULA (PTILELLA) BOREALIS (Sars).

Pennatula grandis, Ehrenberg (1832); non Pallas.*Pennatula borealis*, M. Sars (1856); and Verrill (1878).*Ptilella borealis*, Gray; and Verrill (1879).*Pennatula (Ptilella) borealis*, Verrill (1882).

"A fine large specimen of this species, taken on a trawl line between Sable Island and Banquereau, N.S., was presented to the U.S. Fish Commission by Captain J. W. Collins, of the schooner Marion (Verrill, 1878). Several additional specimens of this species have been received from off Nova Scotia (Verrill, 1879). Taken by the Gloucester fishermen "in 120 to 350 fathoms, on the outer slopes of the Grand Bank, St. Peter's Bank, Western Bank, Banquereau, Sable Island Bank, Le Have Bank and George's Bank, and presented to the U.S. Fish Commission" (Verrill, 1882).

ZOANTHARIA.

CERIANTHIDEA.

Family *Ceridiphidae*.

CERIANTHUS BOREALIS, Verrill.

1873. Amer. Journ. Sc. and Arts, Third Series, vol. v., p. 5.

East of Grand Manan Island, in 28 fathoms, two large specimens, dredged by Professor Verrill in 1872. Large tubes of this species were dredged by the writer, in 1871, 1872 and 1873, in the Gulf of St. Lawrence, between Anticosti and the Gaspé peninsula, in 200 fathoms mud, but only one small living specimen, about an inch long, was taken.

ZOANTHIDEA.

Family *Zoanthidae*.

EPIZOANTHUS INCRUSTATUS (Duben and Koren).

Mammillifera incrustata, Duben and Koren (1847).

Zoanthus incrustatus, Sars (1860).

Epizoanthus Americanus, Verrill (1864).

Epizoanthus canorisocius, Hertwig (1888); not of Studer (1878).

Epizoanthus incrustatus, Haddon and Shackleton (1891).

Taken by the U. S. Fish Commission, in 1872, in the Bay of Fundy, in 40 to 109 fathoms; in 1877, off Nova Scotia, in 50 to 190 fathoms. The Gloucester fishermen often brought it in from the various fishing banks off Nova Scotia and Newfoundland, in 100 to 300 fathoms, 1878-80. Off Grand Manan, in 40 to 50 fathoms, on shells covering *Eupagurus*, and in 109 fathoms, on rocks (Verrill). By the Challenger Expedition it was dredged in 1873, at Station 49, off Nova Scotia, in 85 fathoms. In the Gulf of St. Lawrence, one specimen of the incrusting variety was dredged by the writer off Charleton Point, Anticosti, on a small stone, in 1871; and one, also on a small stone, off Cape Gaspé, in 30 fathoms, in 1872.

EPIZOANTHUS PAGURIPHILUS, Verrill.

1882. Amer. Journ. Sc. and Arts, Third Series, vol. xxiii., p. 137.

"A few specimens taken by the Gloucester halibut fishermen, in deep water, off Nova Scotia, and by ourselves in 1880. The coenenchyma of this species at first invests small univalve shells, occupied by *Parapagurus pilosimanus*, but finally grows far larger than the shell, and eventually absorbs it" (Verrill).

EDWARDSIIDEA.

Family *Edwardsiadae*.

EDWARDSIA SIPUNCULOIDES, Stimpson.

Actinia sipunculoides, Stimpson (1853).*Edwardsia sipunculoides* (Stimpson M. S.); Verrill (1864).

Grand Manan, "at low-water mark, adhering by its very small base to a large stone; only one specimen" (Stimpson). S.S.W. of the east point of Prince Edward Island; one specimen, dredged by the writer in 1873, and since determined by Professor Verrill. Henley Harbour, Strait of Belle Isle, in 4 fathoms (Packard).

EDWARDSIA FARINACRA, Verrill.

1869. Amer. Journ. Sc. and Arts, Second Series, vol. XLVIII., p. 118.

"Bay of Fundy, 8 to 90 fathoms" (Verrill).

ACTINIIDEA.

Malactiniæ.

Family *Ilyanthidæ*.

PEACHIA PARASITICA, Verrill.

1866. Proc. Boston Soc. Nat. Hist., vol. x., p. 338.

"Cape Cod to Bay of Fundy, on *Cyanea arctica*" (Verrill).

Family *Actinidæ*.

METRIDIDIUM DIANTHUS (Ellis).

Actinia dianthus, Ellis (1767); and Johnston (1847).*Actinia plumosa*, Müller (1776).*Metridium dianthus*, Oken (1815).*Actinia marginata*, Lesueur (1817).*Metridium marginatum*, Milne Edwards (1857).*Actinia dianthus*, Stimpson (1853); and Dawson (1858).*Actinoloba dianthus*, Gosse (1860).*Metridium dianthus*, Verrill (1863).

Professor Verrill, who calls this species the "Fringed Actinia," says that it is the "most abundant species along the whole coast of New England and the provinces of New Brunswick and Nova Scotia." It is also by far the commonest species of sea anemone in the Gulf of St. Lawrence, and according to Packard, it occurs as far to the northward as Square Island, on the

Atlantic coast of Labrador, and Indian Harbour, on the north shore of Hamilton Inlet. Southward it is known to range as far as New Jersey, and in depth, from low water to 90 fathoms. In the synonymy of this species, the references prior to 1817 are given on the authority of Professor McMurrich.

SAGARTIA ACANELLA, Verrill.

1883. Bull. Mus. Comp. Zool., vol. xi, p. 46.

"A small orange-coloured species, with numerous long slender tentacles, which, by its base, entirely surrounds and closely clasps the branches of *Acanella Normani*. "It has been dredged by the U. S. Fish Commission at many localities on the East Coast of the United States in deep water," and "it has also often been brought in by the Gloucester fishermen, since 1878, from many localities on the deep fishing banks, off Nova Scotia, and from the Grand Bank" (Verrill).

CHONDRACTINIA NODOSA, (Fabricius).

Actinia nodosa, O. Fabricius (1780); but not *Urticina nodosa*, Verrill (1873), nor *Actinauge nodosa*, Verrill (1883); fide McMurrich.

In a letter to the writer dated Oct. 9th, 1900, Prof. J. Playfair McMurrich says—"the form described by Verrill as *Actinauge nodosa* (Fabricius) is now regarded as a quite distinct species, to which I have given the name *A. Verrillii*. "Verrill's *A. nodosa*, var. *tuberculosa* is in all probability Fabricius' form, which is properly called *Chondractinia nodosa*. According to Verrill, *Actinauge nodosa*, var. *tuberculosa* has "often been brought in from various localities on the fishing banks of Nova Scotia, etc., by the fishermen of Gloucester, Mass., and presented to the U. S. Fish Commission by them." "It has been dredged by the U. S. Fish Commission in the Gulf of Maine and off Nova Scotia."

ACTINAUGE VERRILLII, McMurrich.

Urticina nodosa, Verrill (1873).
Actinauge nodosa, Verrill (1883).
Actinauge Verrillii, McMurrich (1894).

Taken by the U. S. Fish Commission in the Bay of Fundy, in 50 to 150 fathoms, and off Nova Scotia, in 50 to 110 fathoms. "The Gloucester fishermen have brought it in from a large number of localities, on all the fishing banks, from Georges to the Grand Bank, in 30 to 300 fathoms. It is particularly common on the stony bottoms of the Le Have Bank, Western Bank, and Banquereau, off Nova Scotia" (Verrill, 1883). Specimens that have been identified with *Actinia nodosa*, Fabricius, by Verrill, but that are

apparently identical with others that have since been described by McMurich under the name *A. Verrillii*, were dredged by the writer in 1871, in the Gulf of St. Lawrence, off Charleton Point, Anticosti, in 112 fathoms; and about half way between Point des Monts and the west end of Trinity Bay, in 96 fathoms.

ACTINAUGE NEXILIS, Verrill.

1888. Bull. Mus. Comp. Zool., vol. xi, p. 56.

"Numerous specimens, from the various fishing banks off Newfoundland and Nova Scotia, have been brought in by the Gloucester fishermen." These are all on *Balticina*, and mostly from 200 to 300 fathoms" (Verrill).

Family, *Cribrinidae*. (Ehrenberg, teste McMurich).*

CRIBRINA STELLA (Verrill).

Bunodes stella, Verrill (1864).

Bunodes spectabilis, Verrill (1879); non *Actinia spectabilis*, O. Fabr.

Bunodactis stella, Verrill (1899).

Cribrina stella, McMurich, M. S. (1901).†

Grand Manan, in crevices of rocks near low-water mark. Perhaps the same as *Actinia coriacea*, Stimpson (Verrill).

EPIGONACTIS FKCUNDA, Verrill.

1890. Amer. Journ. Sc. and Arts, Fourth Series, vol. vii., p. 378.

"East of Banquereau, off Nova Scotia, 150 fathoms, schooner Polar Wave, lot 37, 1878, one specimen; off Nova Scotia, 200 fathoms, Capt. John Rowe, lot 35, one specimen" (Verrill).

URTICINA CRASSICORNIS (Müller).

Actinia crassicornis, Müller (1776).

Urticina crassicornis, Ehrenberg (1834); et auct.

Tealia crassicornis, Gosse (1858).

Le Have Bank, N.S., in 45 fathoms, U.S. Fish Commission, 1872 (Smith and Harger). Specimens that were identified with this species, in 1873, by Professor Verrill, were dredged by the writer in 1871, 1872, and 1873, at several localities in the northern part of the Gulf of St. Lawrence, at depths of from 30 to 112 fathoms.

* In a letter to the writer, dated April 8, 1901.

† In the same letter.

Family *Paractidae*.

STOMPHIA CARNEOLA (Stimpson).

Actinia carneola, Stimpson (1853).⁴*Rhodactinia Daviesii*, Verrill (1864).*Stomphia carneola*, Verrill (1899).

Grand Manan, "dredged in 35 fathoms on the Hake Ground. The specimens were attached to dead valves of *Pecten*, and sometimes to the test of *Ascidia callosa*, or to small pebbles" (Stimpson); Bay of Fundy (Verrill); Gaspé Bay (Sir J. W. Dawson). "Large specimens dredged at Caribou Island, in 8 fathoms, gravelly bottom, and at Square Island" (Labrador) "in from 15 to 30 fathoms, on a shelly bottom, had three rows of thick, short, blunt tentacles, each with three red circular bands, the outside of the polyp being entirely smooth, with slashes of deep red on a corneous ground. Small specimens were wholly red" (Packard).

ACTINOSTOLA CALLOSA, Verrill.

Urticina callosa, Verrill (1882).*Actinostola callosa*, Verrill (1883).

Dredged by the U. S. Fish Commission off Nova Scotia in 1877. "It has also been taken on George's Bank and the various fishing banks off Nova Scotia, in 45 to 300 fathoms, by the Gloucester fishermen, in considerable numbers" (Verrill, 1883).

ACTINERNUS NOBILIS, Verrill.

1879. Amer. Journ. Sc. and Arts, Third Series, vol. xvii., p. 474.

"Off Sable Island, N.S., 200-250 fathoms, Aug.,—and Banquereau, about 200 fathoms, Sept. 9, 1878,—Capt. J. W. Collins, schooner Marion" (Verrill, 1879). "Common off Nova Scotia in 200 to 300 fathoms" (Verrill, 1885).

SYNANTHUS MIRABILIS, Verrill.

1879. Op. cit. supra., p. 474.

Found, with the preceding species, by Captain Collins, off Sable Island, in 200-250 fathoms, and on Banquereau, N.S., in about 200 fathoms; and since dredged by the SS. Albatross, in 1883, off Nova Scotia, in 150 to 330 fathoms (Verrill).

Family *Boloceridae*.

BOLOCERA TUEDIÆ (Johnston).

Actinia Tuediæ, Johnston (1832).*Anthea Tuediæ*, Johnston (1847).*Bolocera Tuediæ*, Goose (1860); and Verrill (1873).

Dredged by the U. S. Fish Commission, "since 1872, in the deeper parts of the Bay of Fundy and off Nova Scotia, in 50 to 100 fathoms. A few specimens have been brought from the fishing banks, off Nova Scotia, by the Gloucester fishermen" (Verrill, 1883).

(Incertæ sedis.)

ACTINOPSIS WHITEAVESII, Verrill.

1879. Prelim. Check List Mar. Invert. Atlantic Coast, &c.
(Name only.)

Gulf of St. Lawrence, about half way between the S.W. Point of Anticosti and the Gaspé peninsula, in 200 fathoms, mud; a single living specimen, dredged by the writer in 1872.

SCLERACTINIÆ (MADREPORARIA).

Family *Turbinolidae*.

FLABELLUM GOODEI, Verrill.

1878. Amer. Journ. Sc. and Arts, Third Series, vol. xvi., p. 377.

"Taken by Gloucester fishermen from near the Grand Bank, Banquereau, Sable Island Bank and east of George's Bank, in 180 to 400 fathoms," and presented to the U. S. Fish Commission (Verrill).

In 1872, two dead, bleached and very imperfect specimens of a possibly undescribed species of *Flabellum* were dredged by the writer at two different and widely distant localities in the Gulf of St. Lawrence. One of these specimens was taken between the S.W. Point of Anticosti and the Gaspé peninsula, in 200 fathoms, mud; and the other about half way between East Cape, Anticosti, and the Bird Rocks, in 313 fathoms, mud.

FLABELLUM ANGULARE, Moseley.

1876. Proc. Royal Soc., Lond., p. 556.

1880. H.M.S. Challenger Reports, Zoology, vol. II., p. 184.

H.M.S. Challenger, Station 50, off Nova Scotia, in 1,250 fathoms (Moseley). Since dredged by the SS. Albatross, of the U. S. Fish Com-

mission, off the northern coast of the United States, in 906 to 1,467 fathoms (Verrill), but not yet taken in the area embraced within the limits of this paper).

DESMOPHYLLUM NOBILE, Verrill.

1884. Amer. Journ. Sc. and Arts, Third Series, vol. xxviii., p. 150.

"The only specimen known was taken July 15, 1884, on the Stone Fence, on Banquereau, N.S., in about 300 fathoms, by Michael Campbell, of Gloucester, Mass." (Verrill).

Family *Oculinidae*.

LOPHONHELIA OCULIFERA, Edwards and Haime.

"A fragment of a large, dead but nearly fresh specimen of this coral, taken about thirty-nine miles S.S.W. from the N.W. Light of Sable Island, was presented" to the U. S. Fish Commission "by Dennis Theltnemy, schooner Win. Thompson" (Verrill, 1878). "Two specimens have been obtained by the Gloucester fishermen in deep water off the coast of Nova Scotia, and by them presented to the U. S. Fish Commission" (Verrill, 1883).

CTENOPHORA.

CYDIPPIDEA.

Family *Mertensidae*.

MERTENSIA OVUM (Fabricius).

Beroë ovum, O. Fabricius (1780).

Mertensia cucullus, L. Agassiz (1860).

Mertensia ovum, Mörch (1857); and Packard (1867).

"This species was extremely abundant from the Strait of Belle Isle, where there was floating ice on the last of June" (1864) "to as far north as Hopedale," Labrador, in lat. 55° 30'. "It was not commonly met with in waters from which the ice had disappeared" (Packard).

Family *Pleurobrachiidae*.

PLEUROBRACHIA RHODODACTYLA, L. Agassiz.

Beroë pileus, O. Fabricius (1780); non Müller, teste L. Agassiz.

Pleurobrachia rhododactyla, L. Agassiz (1850).

Grand Manan (Stimpson); "very abundant in Casco Bay, Bay of Fundy, and Gulf of St. Lawrence" (Verrill, 1873). "Very abundant about East Point, Anticosti, in July, 1861" (Verrill); "observed but rarely at Little Mecattina Island, Gulf of St. Lawrence" (Packard).

LOBATA.

Family *Bolinae*.

BOLINA ANATA, Agassiz.

Grand Manan (Stimpson); Bay of Fundy (L. Agassiz). "Near Fox Bay, Anticosti, June 29, 1861. Very abundant" (Verrill). "Not observed any farther northward" than Anticosti (Packard).

BEROIDEA.

Family *Beroidea*.

IDYIA ROSEOLA, L. Agassiz.

Bay of Fundy (L. Agassiz); "very abundant in the Bay of Fundy and Gulf of St. Lawrence" (Verrill, 1873). "East Point, Anticosti, very abundant the first of July," 1861 (Verrill). Abundant along the Labrador coast, from Salmon Bay, on the north shore of the Gulf of St. Lawrence, just inside of the Strait of Belle Isle, to Cape Webuc (Harrison) on the Atlantic coast (Packard).

ECHINODERMATA.

CRINOIDEA.

Family *Antedonidae*.

ANTEDON TENELLA (Retzius).

Asterias tenella, Retzius (1783); fide P. H. Carpenter.

Alectro dentata, Say (1825).

Alecto Sarsii, Duben and Koren (1846).

Antedon tenella, P. H. Carpenter (1888).

From various localities off Nova Scotia, on the fishing grounds (Verrill, 1882).

ANTEDON ESCHRICHTII (Müller).

Alecto Eschrichtii, Müller (1841),

Antedon Eschrichtii, Loven (1866).

Grand Manan, "in 25 fathoms, on a shelly ground, near Duck Island" (Stimpson, one small specimen, which Dr. P. H. Carpenter thinks may have been *A. quadrata*). H.M.S. Challenger, Station 48 (May 8, 1873) on the Le Have Bank, N.S., in 51 fathoms rock; several specimens (Carpenter). Dredged by the SS. Speedwell, of the U. S. Fish Commission, in 1877, about

thirty miles south from Halifax, N.S., in 100 fathoms, fine, compact, sandy mud (Verrill, 1878).

ANTEDON QUADRATA, P. H. Carpenter.

1884. Proc. Royal Soc. Edinb. for 1884, pp. 375-377.

1888. H.M.S. Challenger Reps., Zool., vol., xxvi., p. 149.

H.M.S. Challenger, Station 48, on the Le Have Bank, N.S., with the preceding species, several specimens (Carpenter).

HOLOTHURIOIDEA.

ACTINOPODA.

Family *Cucumaridae*.

PENTACTA FRONDOSA (Jaeger). "GREAT SEA CUCUMBER."

Holothuria frondosa, Gunnerus (1767); and O. Fabricius (1780).

Pentacta frondosa, Jaeger (1833); and Stimpson (1853).

Cucumaria frondosa, Forbes (1841); and H. Théel (1886).

Grand Manan. "Nothing can exceed the profusion in which this species exists in some parts of the islands. It is found just below the ordinary low-water mark on rocky shores, and is, therefore, exposed at spring tides. I have seen areas of several square rods entirely occupied by them. The largest observed was nine inches in length and three wide. They are usually black or dark purple above and pale brown or yellowish below. Some specimens are of a uniform bright yellow. They always adhere by one side—that on which the suckers are most developed. They never bury themselves, but are found on the surface of the rocks, and sometimes in chinks or among large pebbles" (Stimpson). "Passamaquoddy Bay,—also L'Etang Harbour, N.B., very large" (Ganong). Gulf of St. Lawrence,—near Ellis Bay, Anticosti (Verrill); off Cap des Rosiers lighthouse, in 7 fathoms, on a rocky bottom (Whiteaves); and near Caribou Island (Packard). Atlantic entrance to Hudson Strait at Port Burwell, Cape Chudleigh, Bell (Verrill).

PENTACTA MINUTA (Fabricius).

Cucumaria minuta, O. Fabricius (1780).

Ocnus Ayresii, Stimpson (1853).

Pentacta minuta, Verrill (1866).

Grand Manan, "dredged on shelly bottoms in 25 fathoms" (Stimpson). Off Nova Scotia, in 60-101 fathoms, SS. Albatross, of the U. S. Fish Commission, 1883 (Verrill). In their "Memoir on the Echinodermata of the Arctic Sea to the west of Greenland," however, Professor Duncan and Mr. Sladen regard *P. minuta* as merely the young of *P. frondosa*.

PENTACTA CALCIGERA, Stimpson.

Off Port Hood, Cape Breton Island, in 25 fathoms, red mud, two specimens, dredged by the writer in 1873. These specimens were at one time referred to *Cucumaria pentactes*, but Professor Verrill regards them as unusually large examples of *P. calcigera*. Gulf of St. Lawrence, on the north shore, at Salmon Bay, near Caribou Island, in 15 fathoms sand, 1860 (Packard). North shore of the Strait of Belle Isle, at Belles Amours, common, in 8 fathoms mud; and Atlantic coast of Labrador, at Cateau Harbour, in 15 fathoms, 1864 (Packard).

PSOLUS PHANTAPUS (L.) "SEA-CUCUMBER."

Holothuria phantapus, L. (1767).

Psolus phantapus, Jaeger (1833).

Psolus levigatus, Ayres (1852).

Grand Manan, "common in 40 fathoms, attached to small stones, and occasionally found at low-water mark. These were all small specimens. The large ones seem to live buried among pebbles; thus at Eastport, one was dug from a depth of six inches in gravel. This measured three inches in length" (Stimpson). Gulf and mouth of the River St. Lawrence, at many localities, dredged by Sir J. W. Dawson, Dr. R. Bell and the writer.

LOPHOTHURIA FABRICII (Duben and Koren). "SEA ORANGE."

Holothuria squamata, O. Fabricius (1780).

Cuvieria Fabricii, Duben and Koren (1844).

Psolus Fabricii, Lutken (1857).

Lophothuria Fabricii, Verrill (1866).

Grand Manan. "Small specimens were dredged abundantly among nullipores in 5 fathoms, and a number of very large ones were found attached to the under surface of large shelving rocks in the fourth sub-region of the littoral zone. The largest was four inches in length, while its tentacles had a spread of nearly five inches and presented a beautiful area of bright red waving plumes" (Stimpson). Found also at Grand Manan by Ludwig and Verrill. Massachusetts Bay to Greenland (Verrill). Between Pictou Island, N.S., and Cape Bear, P.E.I., Whiteaves (Verrill). Gulf and mouth of the River St. Lawrence; off Cap des Rosiers lighthouse, in about 9 fathoms, (Whiteaves); very abundant at Little Métis (Sir J. W. Dawson); and at Esquimaux Bay, near Caribou Island, in 15 fathoms on pebbles, (Packard). Henley Harbour, and Temple Bay, Labrador, in 8 to 10 fathoms, Stearns' expedition (Miss Bush).

In his Report on the Holothurians of the H.M.S. Challenger, Dr. Théel cites *L. squamata* (the *Cuvieria squamata* of Duben and Koren, under the name

Psolus squamatus) as having been taken in the Gulf of St. Lawrence by Bell, and on the coast of New England by Verrill, but expresses a doubt as to its distinctness from *L. Fabricii*.

THYONE SCABRA, Verrill.

1873. Amer. Journ. Sc. and Arts, Third Series, vol. v., p. 100.

"Bay of Fundy" (Verrill).

THYONIDIUM PRODUCTUM (Ayres).

Orcula punctata, L. Agassiz (1851); no description.

Duasmiodactyla producta, Ayres (1852).

Thyonidium productum, Stimpson (1853).

Grand Manan. "This species is found in deep water, but occurs most frequently under stones, or buried to a slight depth in gravel near low-water mark" (Stimpson).

THYONIDIUM PELLUCIDUM (Fleming).

Holothuria pellucida, Fleming (1828).

Cucumaria hyalina, Forbes (1841).

Thyonidium hyalinum, Lutken (1857).

Murray Bay, Sir J. W. Dawson (Verrill).

ORCULA BARTHII, Troschel.

Labrador, Troschel.

Family *Molpadidae*.

EUPYRGUS SCABER, Lutken.

Between Port Hood, C.B., and the east point of Prince Edward Island; also off Bonaventure Island, in 56 fathoms; dredged by the writer in 1873 at the former locality, and in 1872 at the latter. Salmon Bay, near Caribou Island, in 10 fathoms, sand, 1860 (Packard); and Long Island, Cateau Bay, Labrador, in 15 fathoms, 1864 (Packard).

TROCHOSTOMA TURGIDUM (Verrill).

Molpadia turgida, Verrill (1879).

Trochostoma turgidum, Théel (1885).

Bay of Fundy (Verrill and Smith, 1865); off Nova Scotia, 1877, U. S. Fish Commission (Verrill); and Gulf of St. Lawrence, Whiteaves (Verrill).

TROCHOSTOMA OOLITICUM (Pourtales).

Chirodota oolitica, Pourtales (1852).*Trochostoma ooliticum*, Théel (1885).

Between Port Hood, C.B., and the east point of Prince Edward Island, in red mud, Whiteaves, 1873 (Verrill).

CAUDINA ARENATA, Stimpson.

Milne Bank, Northumberland Strait, four or five specimens; and Pointe du Chêne, Shediac Bay, N.B., at low water, one specimen, collected by the writer in 1873.

PARACTINOPODA.

Family *Synaptidae*.

CHIRODOTA LÆVIS (O. Fabricius).

Holothuria laevis, O. Fabricius (1780).*Synapta coriacea*, L. Agassiz (1851).*Trochinus pallidus*, Ayres (1852).*Chirodota laevis*, Stimpson (1853).

"This species is fully and well described by Otho Fabricius, and his account of its habits applies precisely to those of our species, as I have often observed at Grand Manan. It lives in the stony mud of the shores of these islands, buried to a depth of a few inches, usually in a horizontal position. It is found at low-water, but is most abundant at a depth of 4 or 5 fathoms" (Stimpson). "Craig's Ledges, Passamaquoddy Bay, about four miles from St. Andrews, lowest tides, abundant" (Ganong, 1884). Gulf of St. Lawrence, near Ellis Bay, Anticosti, under rocks at low water (Verrill, 1861); and Salmon Bay, near Caribou Island, in 10 fathoms, sand, 1860 (Packard). Atlantic Coast of Labrador, at "Temple Bay, in 5 fathoms; Fox Harbour, in 1 fathom; Dead Island, near Square Island, in 2 to 4 fathoms;" Stearns expedition, (Miss Bush).

MYRIOTROCHUS RINKII, Steenstrup.

Myriotrochus Rinkii, Steenstrup (1852).(?) *Oligotrochus vitreus*, M. Sars (1866).*Myriotrochus vitreus*, Duncan and Sladen (1881).

A few specimens of this arctic species were dredged by the writer, in 1873, in the Gulf of St. Lawrence, in 50 fathoms, nine miles and a half south-east of Grand Pabou (a little to the north of the Baie des Chaleurs), and at the entrance to Gaspé Bay. Packard, who had previously dredged it on the

Labrador coast in 1864, says: this "beautiful species first occurred in abundance in patches of sand on a stony bottom in 7 fathoms at the anchorage in Domino Harbour. It was afterwards found commonly in 15 to 30 fathoms at Square Island; also at Thomas Bay, 15 fathoms, sand; Long Island, Sandwich Bay, 15 fathoms, sand."

STELLEROIDEA.

ASTEROIDEA.

PHANEROZONIA.

Family *Archasteridae*.

PONTASTER HEBITUS, Sladen.

Archaster tenuispinus, Verrill (1879); "perhaps not of Duben and Koren."
Pontaster hebitus, Sladen (1889).

"Bathymetrical range, 85 to 250 fathoms." This species is known only from the banks of Nova Scotia and Newfoundland. "It is very closely allied to *P. tenuispinus* of northern Europe, if not identical" (Verrill, 1895).

PSEUDARCHASTER INTERMEDIUS, Sladen, var. *INSIGNIS*, Verrill.

1895. Amer. Journ. Sc. and Arts, Third Series, vol. XLIX, p. 132.

Bathymetrical range, 100 to 1356 fathoms. Nova Scotia to N. lat. 40° 09' 30" (Verrill).

Family *Porcellanasteridae*.

CTENODISCUS CRISPATUS (Retzius).

Asterias crispatus, Retzius (1805).
Ctenodiscus crispatus, Duben and Koren (1844).
Ctenodiscus corniculatus, Perrier (1875).

"This fine starfish is by no means rare in New England, although not yet noted by our naturalists. At Grand Manan it occurred on muddy bottoms in 50 and 60 fathoms" (Stimpson). In his Handbook of Zoology, published in 1870, Sir J. W. Dawson says that it has been found on the "coast of Nova Scotia." It is one of the most characteristic starfishes of the greatest depths of the Gulf of St. Lawrence. Living specimens of it were dredged by the writer, in 1871, off Bear Head, Anticosti, in 120 fathoms; in 1872 and 1873, at several localities to the south and south-east of Anticosti, in 108 to 220 fathoms; and in 1873, one large specimen was dredged at the entrance to Gaspé Bay, in 50 fathoms. Verrill says that it ranges in

depth from 5 to 632 fathoms, but that it is most abundant from 50 to 150 fathoms, also that it has been "taken at numerous stations in Massachusetts Bay, Bay of Fundy, &c." and that it "extends to Greenland, Spitzbergen, and northern Europe."

Family *Astropectinidae*.

LEPTOPTYCHASTER ARCTICUS (M. Sars).

Astropecten arcticus, M. Sars (1851).

Archaster arcticus, Verrill (1878).

Leptoptychaster arcticus, Sladen (1889).

Dredged by the SS. Speedwell, of the U. S. Fish Commission, in 1877, about thirty miles south of Halifax, N.S., in 100 fathoms, fine, compact, sandy mud (Verrill, 1878).

PSILASTER FLORÆ, Verrill.

Archaster Floræ, Verrill (1878).

Psilaster Floræ, Verrill (1894).

Dredged by the SS. Speedwell, in 1877, with the preceding. "It has also been sent by the Gloucester fishermen, from several localities on the various banks off Nova Scotia, in 60 to 230 fathoms" (Verrill, 1878).

Family *Pentagoniasteridae*.

TOSIA GRANULARIS (Retzius).

Asterias granularis, Retzius (1783).

Astrogonium granulare, Muller and Troschel (1842).

Pentagonaster granularis, Perrier (1876).

Tosia granularis, Verrill (1899).

Off Halifax, Nova Scotia (Sir J. W. Dawson, 1870). Dredged by the SS. Speedwell, in 1877, with the two preceding species, and taken also by Gloucester fishermen on the banks off Nova Scotia (Verrill). It seems to be a circumpolar species, as a fine specimen was dredged by Dr. G. M. Dawson, in 1885, in 40 fathoms, off the mouth of the Qualicum River, in the Strait of Georgia, B.C.

TOSIA EXIMIA, Verrill.

Pentagonaster eximius, Verrill (1894).

Tosia eximia, Verrill (1899).

"This species was taken by the SS. Albatross," of the U. S. Fish Commission, "in 1883, off Le Have Bank, at Station 2064," in 122 fathoms;

and in 1885 off Nova Scotia, at Station 2507, N. lat. $44^{\circ} 27' 30''$, W. long. $62^{\circ} 33' 30''$, in 80 fathoms. "A single specimen was obtained at each locality" (Verrill, 1894).

Family *Antheneidae*.

HIPPASTERIA PHRYGIANA (Parelius).

Asterias phrygiana, Parelius (1770).

Asterias equestris, Pennant (1776).

Hippasteria plana, Gray (1841).

Goniaster equestris, Forbes (1841).

Astrogonium phrygianum, Muller and Troschel (1842).

Hippasteriu phrygiana, Agassiz (1865).

Grand Manan, "a large specimen was taken off Duck Island, in the coralline zone" (Stimpson). The species has since been dredged at the same locality by Dr. J. W. Fewkes, in 1889. Sir J. W. Dawson, in his Handbook of Zoology (1870) records its occurrence on the coast of Nova Scotia, and Verrill in 1878 states that it was dredged by the SS. Speedwell of the U. S. Fish Commission, "in 1877, about thirty miles south of Halifax, in 100 fathoms."* Still later, in 1895, he says that its bathymetrical range is from 20 to 224 fathoms; in one instance, off Georges Bank, in 471 fathoms, but that it is most common from 50 to 150 fathoms. He adds that it has been "taken at numerous stations in Massachusetts Bay, off Cape Ann, Gulf of Maine, Bay of Fundy, and off Nova Scotia, on hard bottoms." It occurs also on the European coasts and in the Arctic Ocean. "No other species of the genus is known."†

Family *Asterinidae*.

TREMASTER MIRABILIS, Verrill.

1879. Proc. U. S. Nat. Mus., vol. II., p. 201.

"Bathymetrical range, 150 to 250 fathoms, rare. Known only from the banks of Nova Scotia and Newfoundland, from N. lat. $47^{\circ} 6'$ to near Georges Bank. "All the specimens have been received from the Gloucester fishermen. No other species of this remarkable genus is known" (Verrill, 1895).

* American Journal of Science and Arts, Third Series, vol. xvi., p. 373.

† Idem., Third Series, vol. XLIX., p. 137.

CRYPTOZONIA.

Family *Solasteridae*.**SOLASTER ENDECA** (Retzius). "PURPLE SUN STAR."*Asterias endeca*, Retzius (1783).*Solaster endeca*, Forbes (1839); et auct.

Grand Manan, "abundant on the rocks at low-water mark in the summer, at some localities, but the specimens are always small and never more than half grown. The large individuals, some of which are a foot in diameter, are found only in deep water, chiefly in the laminarian zone" (Stimpson). Common in the Bay of Fundy, from low-water to 80 fathoms and off Cape Cod, in 26 to 50 fathoms (Verrill). Pendleton's Island reefs, and Bar Island, at the mouth of L'Etang Harbour, N.B. (Ganong). Taken on all the fishing banks off Nova Scotia, in 40 to 150 fathoms (Verrill). Common at many localities in the Gulf and mouth of the River St. Lawrence, where it has been collected by Sir J. W. Dawson, the writer, and others. Long Island, Cateau Bay, Labrador, in 15 fathoms, rare, with *Crossaster papposus* (Packard). It occurs on the coast of Greenland and northern Europe and is probably circumpolar (Verrill).

SOLASTER SYRTENSIS, Verrill.

1894. Proc. U. S. Nat. Mus., vol. xvii., p. 271.

"Taken by the U. S. Fish Commission off Cape Cod (Sta. 264) in 80 fathoms; and off Cape Sable, N.S., in 101 fathoms (Sta. 85, 86, 1877). "Several specimens, received from the Gloucester fishermen, were taken on the fishing banks from George's to Banquereau, N.S." (Verrill, 1895).

SOLASTER EARLII, Verrill.

1879. Amer. Journ. Sc. and Arts, Third Series, vol. xvii., p. 473;
and (1895) *ibid.*, vol. xlix., p. 200.

"Brought by the Gloucester fishermen from several of the banks off Nova Scotia and Newfoundland, from N. lat. 45° 25' to George's Bank; taken mostly in 170 to 300 fathoms" (Verrill, 1895). The species "is allied to *S. Dawsoni*, Verrill," which was described in the Report of Progress of the Geological Survey of Canada for 1878-79, p. 193B, from a specimen dredged by Dr. G. M. Dawson in 1878, at Virago Sound, Graham Island, B.C., in from 8 to 15 fathoms.

CROSSASTER PAPPUSUS (O. Fabricius). "COMMON SUN STAR."

Asterias papposa, O. Fabricius (1780).

Solaster papposus, Forbes (1839).

Crossaster papposus, Muller and Troschel (1840).

The Common Sun Star, with its twelve to fifteen rays, is widely distributed on both sides of the North Atlantic. On the North American side of that ocean it is known to range from Massachusetts Bay to Greenland, and in depth from low-water mark to 179 fathoms, usually, if not always, on a hard bottom. Stimpson found it, but not very abundantly, at Grand Manan; Ganong on the reefs around Pendleton's Island, in Passamaquoddy Bay, and at L'Etang Harbour, Charlotte Co., N.B.; and Verrill says that it has been found on all the fishing grounds off Nova Scotia. In the Gulf and mouth of the River St. Lawrence it has been collected at or near low-water mark, or dredged, at many localities, by Sir J. W. Dawson, Bell, Packard, and the writer; and in the Strait of Belle Isle and Atlantic coast of Labrador by Packard and the Stearns expedition.

Sir J. W. Dawson says that it has been found fossil in the Leda clay at Montreal, and in the Pleistocene at Greens Creek, near Ottawa.

LOPHASTER FURCIFER (Duben and Koren).

Solaster furcifer, Duben and Koren (1844).

Lophaster furcifer, Verrill (1878).

"Bathymetrical range, 234 to 640 fathoms" (150 fathoms, 1883, George's Bank). "Rare; chiefly northern; it occurs in moderate depths in the Gulf of Maine and off the Nova Scotia coast" (Verrill, 1895).

Family Pterasteridae.

PTERASTER PULVILLUS, M. Sars.

"Bay of Fundy, 20 fathoms;" and "banks off Nova Scotia and Newfoundland" (Verrill, 1895).

PTERASTER MILITARIS (Müller).

Asterias militaris, Müller (1776).

Pteraster militaris, Muller and Troschel (1842).

First discovered on the American side of the Atlantic by Dr. Stimpson, who dredged three specimens in the Hake Bay, Grand Manan Island, in 35 fathoms, shelly ground, in 1852. Verrill, in 1895, says that the species is common in the Bay of Fundy, in 10 to 50 fathoms. In the Gulf of St. Lawrence specimens of it were dredged by the writer in 1871, on the north shore, off Sawhill Point, in 69 fathoms; in 1872, eight miles south-east of Bonaventure Island, in 56 fathoms; and in 1873, on the Orphan Bank.

Family *Echinasteridae*.

CRIBRELLA PECTINATA, Verrill.

• 1894. Proc. U. S. Nat. Mus., vol. XVII., p. 278.

Bay of Fundy, in shallow water, about 20 fathoms (Verrill, 1895).

CRIBRELLA SANGUINOLENTA (Müller). "EYED CRIBRELLA."

Asterias sanguinolenta, Müller (1776).

Asterias oculata, Pennant (1777).

Asterias spongiosa, O. Fabricius (1780); and Gould (1841).

Linkia oculata, Forbes (1839); and Stimpson (1853).

Cribella oculata, Forbes (1841).

Echinaster oculatus, Muller and Troschel (1842).

Linkia pertusa, Stimpson (1853).

Echinaster sanguinolentus, M. Sars (1861).

Cribrella sanguinolenta, Lutken (1859).

Cribrella oculata, Perrier (1875).

Dr. Stimpson found this species at Grand Manan at low-water mark and at a depth of 30 fathoms, on rocks, in 1852; and Professor Ganong says that it is abundant everywhere on the southern coast of New Brunswick. It has been collected or dredged by the writer in Northumberland Strait; by Sir J. W. Dawson, Dr. Bell, Dr. Packard, Professor Verrill and the writer at many localities in the Gulf and mouth of the River St. Lawrence, and by Packard and the Stearns expedition in the Strait of Belle Isle and on the Atlantic coast of Labrador. On the western side of the North Atlantic the species is known to range from Cape Hatteras to Greenland, and from low-water mark to a depth of 471 fathoms.

Dr. J. W. Gregory says* that *Cribrella*, Agassiz, is a synonym of *Henricia*, Gray.

Family *Pedicellasteridae*.

PEDICELLASTER TYPICUS, M. Sars.

A few specimens that have been identified with this Norwegian species by Professor Verrill, were dredged by the writer in 1872, in the northern part of the Gulf of St. Lawrence, off Cape Gaspé and Cap des Rosiers, in 75 to 80 fathoms.

*On page 268, of Part III., of Dr. E. Ray Lankester's "Treatise on Zoology."

Family *Stichasteridae*.

STICHAETER ALBULUS (Stimpson).

Asteracanthion albulus, Stimpson (1853).*Stichaster albulus*, Verrill (1866 and 1895).*Stephanasterias albula*, Verrill (1871).

Grand Manan. "They occurred most frequently among branching nullipores, in 4 or 5 fathoms, on the east side of the islands" (Stimpson). "Eastport, Me., and Grand Manan, in 10 to 20 fathoms, rocky bottoms, and among nullipores; also frequent at low-water of spring tides among rocks." "Common from low water mark to 100 fathoms in the Bay of Fundy and off the coast of Nova Scotia" (Verrill). The species is known to range from Cape Hatteras to "Greenland, Iceland and other parts of the Arctic Ocean, and the northern coast of Europe," from 0 to 435 fathoms.

Family *Asteriidae*.

ASTERIAS FORBESII (Desor).

Asteracanthion Forbesii, Desor (1848).*Asterias arenicola*, Stimpson (1862).*Asteracanthion berylinus*, (L. Ag., M. S.) A. Ag. (1863).*Asterias Forbesi*, Verrill (1866).

Doucette Island, St. Croix River; and shores of the large island (Rogers Island) in Oak Bay, N.B. (Ganong, 1888 and 1889).

ASTERIAS VULGARIS (Stimpson) Verrill. "STARFISH, FIVE-FINGER, CROSSFISH."

Asteracanthion rubens, Stimpson (1853).*Asterias vulgaris*, (Stimpson, M.S.) Packard (1863). No description.*Asteracanthion paltidus* (L. Ag., M. S.) A. Ag. (1863). No description.*Asterias vulgaris*, Verrill (1866). Description.

This common large five-rayed starfish, which, according to Stimpson, attains to a diameter of a foot or more, is widely and abundantly distributed throughout the whole of the region now under consideration. It is pre-eminently the common starfish of the Gulf of St. Lawrence. At Grand Manan it has been collected by Stimpson; in the "Bay of Fundy, from above low-water mark to 60 fathoms," by Verrill; in Passamaquoddy Bay by Ganong; and in Northumberland Strait by the writer. At many localities in the Gulf and mouth of the River St. Lawrence it has been collected by Sir J. W. Dawson, Bell, Packard and Verrill and the writer. In the Strait of Belle Isle and Atlantic coast of Labrador it has been collected by Packard and the Stearns expedition; and at the entrance to Hudson Strait by Bell. "Bathymetrical range, 0 to 358 fathoms;

most abundant in 1 to 60 fathoms. "Belongs to the cold areas. "Eastern part of Long Island to Labrador, in shallow water; in deep water it ranges southward as far as off Cape Hatteras" (Verrill, 1895).

ASTERIAS STELLIONURA, Perrier.

Asteracanthion stellionura, Perrier (1869).

Asterias stellionura, Perrier (1875); and Verrill (1878).

This large and remarkable species, previously known only from Iceland to Greenland, was dredged by our party on the steamer Speedwell, of the U. S. Fish Commission, "in 1877, at several localities off Nova Scotia, in large numbers. "It was especially abundant off Cape Sable, in 88 to 92 fathoms, fine compact sand; and off Halifax, in 100 fathoms, sandy mud, where it was associated with *Astrogonium granulare*, *Hippasteria phrygiana*, *Archaster Parelii*, *Archaster arcticus*, *Antedon Sarsii*, and many other arctic species" (Verrill, 1878). *

ASTERIAS ENOPLA, Verrill.

1895. Amer. Journ. Sc. and Arts, Third Series, vol. XLIX., p. 208.

Off Nova Scotia, in 53 to 100 fathoms, two specimens (Verrill).

ASTERIAS POLARIS (Muller and Troschel).

Asteracanthion polaris, Muller and Troschel (1842).

Asterias polaris, Verrill (1866).

Gaspé Basin, "some small specimens, probably young of this species" (Sir J. W. Dawson, 1858); "very abundant along the whole coast" (of the Gaspé peninsula) "below Rimouski" (Bell, 1858). Near Caribou Island (Packard, 1860); from low water to 20 fathoms, at Anticosti Island, also dredged in 15 fathoms on a rocky bottom at Mingan Island, by the Anticosti expedition in 1861 (Verrill). Square Island and Hopedale, on the Atlantic coast of Labrador (Packard) 1864. This common, large and six-rayed northern species has since been found at many localities in the Gulf and mouth of the River St. Lawrence by Sir J. W. Dawson and the writer. Verrill says that it ranges from George's Bank to Greenland, in from 0 to 60 fathoms, and that it has been taken by the Gloucester fishermen "on all the banks" (off Nova Scotia, &c.) "in 20 to 50 fathoms." L'Anse au Loup (north side of the Strait of Belle Isle) one young specimen in 8 fathoms; and Bonne Esperance, Esquimaux Bay, at low water, abundant; Stearns' expedition (Miss Bush). Atlantic entrance to Hudson Strait, at Port Burwell, Cape Chudleigh (Bell, 1884).

* American Journal of Science and Arts, Third Series, vol. xvi., p. 214.

LEPTASTERIAS TENERA (Stimpson).

Asterias tenera, Stimpson (1862).*Asterias (Leptasterias) tenera*, Verrill (1866).*Leptasterias tenera*, Verrill (1874).

"Cape Cod to Newfoundland." Common in Massachusetts Bay and the Bay of Fundy, in 10 to 40 fathoms. "This is very closely allied to *L. compta*, of which it may be only a poorly nourished slender variety" (Verrill, 1895).

LEPTASTERIAS GRÆNLANDICA (Lutken).

Asteracanthion Grænländicum, Lutken (1857).*Asterias Grænländica*, Verrill (1866).*Leptasterias Grænländica*, Verrill (1879).

A single specimen of this species was dredged in 15 fathoms, rocky bottom, off Ellis Bay, Anticosti, by the Anticosti expedition in 1861. Since then specimens which are probably referable to this species have been dredged at many localities in the Gulf and mouth of the River St. Lawrence by Sir J. W. Dawson and the writer. Verrill says that it has been taken on the fishing banks off Nova Scotia and in the Bay of Fundy, in from 5 to 100 fathoms, as well as in the Gulf of St. Lawrence and that it is "strictly northern." Professor Ganong, in his paper on the "Echinodermata of New Brunswick" (published in Bulletin No. 7 of the Natural History Society of that province) includes Stimpson's *Asteracanthion Mulleri* among the synonyms of this species. In this connection, Prof. Verrill says that, besides *L. compta*, *L. tenera*, *L. Grænländica*, *L. hispidella* and *L. littoralis*, "there are other forms on our northern coast that may be distinct, but need much study. Some of these have hitherto been referred to *L. Mulleri* and to *L. Stimpsoni*" (Verrill, 1866).*

LEPTASTERIAS LITTORALIS (Stimpson).

Asteracanthion littoralis, Stimpson (1853).*Asterias littoralis*, Verrill (1866).*Leptasterias littoralis*, Verrill (1883).

Grand Manan, "very common among the fuci in the middle region of the littoral zone or even near high-water mark, elsewhere I have never found it" (Stimpson); "Fastport and Grand Manan, abundant from half tide to low-water mark, among rocks and fuci" (Verrill). Fishing banks off Nova Scotia (Verrill). Gulf of St. Lawrence, Whiteaves (Verrill). Dead Island, near Square Island, Labrador; in 1 to 5 fathoms, several specimens, Stearns expedition (Miss Bush). Port Burwell, Cape Chudleigh (Bell). Casco Bay, Me., to Cumberland Gulf, in 0 to 23 fathoms. "Very closely allied to *L. Grænländica*" (Verrill, 1895).

* American Journal of Science and Arts, March, 1866, Third Series, vol. XLIX., p. 211.

Family *Brisingida*.

ODINIA AMERICANA, VERRILL.

Brisinga Americana, Verrill (1880).*Freyella Americana*, Sladen (1889).*Odinia Americana*, Verrill (1894).

"Bathymetrical range, 175 to 400 fathoms. Two specimens were taken by the Gloucester fishermen on Banquereau, off Nova Scotia, one at N. lat. 44° 12', W. long. 58° 37', clinging to *Paragorgia arborea*. Both of our specimens had 20 (detached) arms. It grows to great size" (Verrill, 1895).

OPHIUROIDEA.

OPHIURÆ.

Family *Ophiolepidida*.

OPHIOGLYPHA SARSII (Lutken).

Ophiolepis ciliata, Stimpson (1853); non Retzius, sp. (1806).*Ophiura Sarsii*, Lutken (1854).*Ophioglypha Sarsii*, Lynnan (1865).

Grand Manan. "This species is much larger than" *O. robusta*, "of a bluish-gray colour above and white below." "It is also very different in station, being found only on muddy bottoms and in deep water. I have taken it at a depth of 60 fathoms" (Stimpson). Bay of Fundy, in 150 fathoms (Verrill, 1872); abundant on the southern coast of New Brunswick in 10 fathoms (Ganong, 1888). The largest and one of the most widely distributed brittle stars of the Gulf and mouth of the River St. Lawrence, in from about 25 to 250 fathoms. It is particularly large and abundant in 125 fathoms, six miles from shore, opposite Cap des Rosiers lighthouse, where it was dredged by the writer in 1871. In fresh specimens taken at this locality the upper surface of the disk varied in colour from grayish or ash-coloured, to greenish, purplish, or even bright red. Packard found this species at Cateau Bay, Long Island, on the Atlantic coast of Labrador, of large size, in 15 fathoms, on a sandy bottom. Miss Bush says that two specimens were taken in 10 fathoms at Henley Harbour (Chateau Bay, on the north side of the Strait of Belle Isle) by the Stearns expedition in 1882; Dr. Bell collected it at Port Burwell, Hudson Strait, in 1884, and it has been found at Greenland. Professor Verrill* says that he has seen a few four-armed specimens of it from off Nova Scotia.

According to Sir J. W. Dawson, it has been found fossil in the Leda clay of St. John, N.B., by Dr. G. F. Matthew.

OPHIOGLYPHA ROBUSTA (Ayres).

Ophiopholis robusta, Ayres (1852).*Ophioglypha robusta*, Lyman (1865).

Grand Manan, "abundant in the laminarian zone, and sometimes also at low-water mark on rocky and nullipore bottoms. A small graceful species, with flat disk and long slender arms tapering to mere threads. It is always highly coloured, usually variegated with red, but sometimes jet black" (Stimpson).

In the Gulf of St. Lawrence specimens of *O. robusta* were dredged by the writer between Anticosti and the Gaspé peninsula, in 110 to 220 fathoms, in 1872; also on the Orphan Bank and at the entrance to Gaspé Bay, in 20 to 50 fathoms, in 1873. Miss Bush says that it was "the most abundant species" obtained by the Stearns expedition, and that it was taken at L'Anse au Loup, Henley Harbour and Temple Bay in 10 to 15 fathoms. Dr. Bell collected it at Port Burwell, Hudson Strait. The species is known to range from Massachusetts Bay to Greenland, the Arctic Ocean, northern Europe and Alaska, and in depth, from low-water mark to 220 fathoms or more.

OPHIOGLYPHA STUWITZI (Lutken).

Ophiura Stuwitzi, Lutken (1857).*Ophioglypha stuwitzi*, Lyman (1865).

A single specimen, dredged many years ago at Murray Bay by Sir J. W. Dawson, has been identified with this species by Professor Verrill.

OPHIOGLYPHA NODOSA (Lutken).

Ophiura nodosa, Lutken (1857).*Ophioglypha nodosa*, Lyman (1865).

Common at all depths in the Gulf of St. Lawrence, and northward to the Atlantic coast of Labrador, Hudson Strait and Greenland; but its name does not occur in Stimpson's "Synopsis of the Marine Invertebrata of Grand Manan," nor in Ganong's "Echinodermata of New Brunswick."

OPHIOGLYPHA SIGNATA, Verrill.

1882. Amer. Journ. Sc. and Arts, Third Series, vol. xxiii., p. 220.

' Bay of Fundy, and off Nova Scotia ' (Verrill).

Family *Amphiuridae*.

AMPHIURA SUNDEVALLI (Muller and Troschel).

Ophiolepis Sundevalli, Muller and Troschel (1842).*Amphiura Holbolli*, Lutken (1854).*Amphiura Sundevalli*, Ljungman (1866).

"Found in 15 fathoms at Cateau Bay," Long Island, Labrador, "on a sandy bottom," in 1864 (Packard); and by the Stearns expedition at Henley Harbour, Chateau Bay, in 10 to 15 fathoms (Miss Bush). A very slender and fragile brittle star, dredged abundantly in the deep sea mud (180-300 fathoms) to the south and south-east of the Island of Anticosti, was referred to *A. Holbolli*, by the writer, in 1871, but Professor Verrill, in 1873, thought it "near *Ophiopeltis borealis*, Sars," which Lyman says is an *Amphiura*. Verrill, however, in 1899, gives the Gulf of St. Lawrence as the locality for *A. Sundevalli*.

AMPHIURA EXIGUA, Verrill.

1899. Trans. Conn. Ac. Arts and Sc., vol. x., p. 311.

Gulf of St. Lawrence (Verrill).

AMPHIURA CANADENSIS, Verrill.

1899. Idem, p. 311.

Gulf of St. Lawrence (Verrill).

AMPHIPHOLIS ELEGANS (Leach).

Ophiura elegans, Leach (1815).*Ophiocoma neglecta*, Forbes (1841).*Ophiolepis tenuis*, Ayres (1852).*Amphiura tenuis*, Lyman (1860).*Amphiura squamata*, Lyman (1865) non Della Chiage, teste Ljungman.*Amphipholis elegans*, Verrill (1873).

Grand Manan, "among nullipores below low-water mark, frequent" (Stimpson); "Bay of Fundy, low-water to 60 fathoms, common" (Verrill 1872). Gulf of St. Lawrence, between Anticosti and the Gaspé peninsula, in 210 fathoms, one specimen (Whiteaves, 1873). "Off New Jersey to the Arctic Ocean" (Verrill, 1872).

OPHIOPHOLIS ACULEATA (L.).

Asterias aculeata, (L.) Gmelin (1788); fide Lyman.

Asterias ophiura, O. Fabricius (1780).

Ophiura bellis, Fleming (1828).

Ophiocoma bellis, Forbes (1841).

Ophiopsis scolopendrica, Muller and Troschel (1842).

Ophiopholis aculeata, Gray (1848).

Ophiopholis scolopendrica, Stimpson (1853).

Ophiopholis bellis, Lyman (1865).

Common from off Cape Hatteras, Virginia, and New Jersey (Verrill), the Bay of Fundy, Gulf of St. Lawrence, Labrador coast and Hudson Strait, to the "Arctic Ocean, Iceland, Spitzbergen, and northern coasts of Europe, the English Channel, Ireland, etc.," from low-water mark to 100 fathoms or more. It is uncertain to what family *Ophiopholis* should now be referred, as the genus is not even mentioned in Verrill's latest scheme of classification of the North American *Ophiuroidea*, in the Transactions of the Connecticut Academy of Arts and Sciences for October, 1899.

Family Ophiacanthidae.

OPHIACANTHA BIDENTATA (Retzius).

Asterias bidentata, Retzius (1805).

Ophiacantha spinulosa, Muller and Troschel (1842).

Ophiacantha bidentata, Ljungman (1871).

Abundant throughout the whole region, from near low-water mark to 250 fathoms or more. The species is known to range from Cape Cod to Greenland, Norway and Spitzbergen.

According to Sir J. W. Dawson it has been found fossil in the Leda clay at the Tanneries, Montreal.

OPHIACANTHA ANOMALA, G. O. Sars.

Off Nova Scotia, in 101 to 131 fathoms, U. S. Fish Commission, dredged by the SS. Albatross in 1883. "This species is easily recognized by having regularly six arms" (Verrill).

OPHIACANTHA SPECTABILIS, G. O. Sars.

Off Nova Scotia, in 131 fathoms, also dredged by the SS. Albatross in 1883 one specimen only (Verrill).

OPHIACANTHA VARISPINA, Verrill.

1885. Ann. Rep. U. S. Fish Commission for 1883 p. 545.

Off Nova Scotia, 101 to 200 fathoms, Albatross dredgings of 1883 (Verrill).

OPHIACANTHA GRANULIFERA, Verrill.

1885. Idem, p. 546.

Off Nova Scotia, in from 101 to 200 fathoms, Albatross dredgings of 1883 (Verrill).

OPHIOLEBES ACANELLA, Verrill.

1885. Idem, p. 548.

"On *Paramuricea borealis*, in 113 to 122 fathoms, off Nova Scotia" (Verrill). Dredged by the SS. Albatross in 1883.

Family *Ophioscolicidae*.

OPHIOSCOLEX GLACIALIS, Muller and Troschel.

Two or three living specimens that have been referred to this species by Professor Verrill, were dredged by the writer in 1873, in 210 fathoms to the S.W. by S. of the island of Anticosti.

Family *Gorgonocephalida*.

GORGONOCEPHALUS EUCNEMIS (Muller and Troschel.)

Asterias caput medusae, O. Fabricius (1780).

Astrophyton eucnemis, Muller and Troschel (1842).

Gorgonocephalus eucnemis, Lyman (1882).

In his "list of Animals dredged near Caribou Island" in 1860, published in the "Canadian Naturalist and Geologist" for December, 1863, Dr. Packard says that one specimen of this species "was hauled up by a fisherman twenty miles from land in about 80 fathoms," and that specimens of it are "common and very large in 18 fathoms on the crown of the bank" off Caribou Island.

GORGONOCEPHALUS AGASSIZII (Stimpson).

Euryale scutatum, Gould (1841); not of deBlainville.

Astrophyton scutatum, Stimpson (1853).

Gorgonocephalus Agassizii, Lyman (1882).

Grand Manan, not uncommon. "It is found in the coralline zone, especially among forests of *Boltenia*" (Stimpson). Bay of Fundy, very common, low-water to 100 fathoms (Verrill); Friar's Cove and Blacks Harbour, Charlotte Co., N.B. (Ganong). Brought up occasionally on fishermen's lines at many localities in the Gulf and mouth of the River St. Lawrence, where it has also been dredged or otherwise collected by Dr. R. Bell, the writer and others.

GORGONOCEPHALUS LAMARCKII (Muller and Troschel).

Astrophyton Lamarckii, Muller and Troschel (1842).

Gorgonocephalus Lamarckii, Lyman (1882).

"Common off Nova Scotia on *Alcyonaria*." Dredged by the SS. Albatross, of the U. S. Fish Commission, in 194 fathoms in 1882, and in 239 fathoms in 1883 (Verrill).

Family *Astronycidae*.

ASTRONYX LOVENI, Muller and Troschel.

H.M.S. Challenger, Station 49 (May 20, 1873), lat. 43° 3' N., long. 63° 39' W. (about 100 miles south of Halifax) in 85 fathoms, gravel and stones (Lyman).

ECHINOIDEA.

DIADEMOIDA.

Family *Strongylocentrotidae*.

STRONGYLOCENTROTUS DROBACHIENSIS (Müller).

Echinus Drobachiensis, Müller (1776).

Echinus neglectus, Lamarck (1816).

Echinus granularis, Say (1827); non Lamarck.

Echinus granulatus, Gould (1841).

Toxopneustes Drobachiensis, L. Agassiz (1846).

Euryechinus Drobachiensis, Verrill (1866).

Strongylocentrotus Drobachiensis, A. Agassiz (1872).

The common sea urchin of the Bay of Fundy and Gulf of St. Lawrence, which is abundant throughout the whole region, especially in very shallow water. In the Bay of Fundy, Professor Verrill says that it ranges in depth from low-water mark to 109 fathoms, and in the Gulf of St. Lawrence it is very common a little below low-water mark or in less than 10 fathoms,

though a few very small but living specimens were dredged by the writer at various localities, in 20, 30, 56, 60, 75 to 80 and 110 fathoms, in 1872. The species is circumpolar, and, on the western side of the Atlantic, ranges from New Jersey to the Arctic Ocean.

Sir J. W. Dawson says that it occurs rarely as a fossil in the Leda clay of Rivière du Loup, Beauport, St. Nicholas and Montreal.

GNATHOSTOMATA.

Family *Scutellidae*.

ECHINARACHNIUS PARMA (Lamarck).

Scutella parma, Lamarck, (1816).

Echinarachnius parma, (Gray (1825).

Echinarachnius Atlanticus (Gray) Stimpson (1853).

Common in the Bay of Fundy, Atlantic coast of Nova Scotia, Gulf and mouth of the River St. Lawrence, and Strait of Belle Isle, from a little below low-water mark to 15 fathoms, usually upon sandy bottoms. Southward, it is known to range to Chesapeake Bay, and to 100 fathoms or more in depth. It is common also on both sides of the north Pacific.

ATELOSTOMATA.

Family *Spatangidae*.

SCHIZASTER FRAGILIS (Duben and Koren).

Dredged by the SS. Bache, of the U. S. Fish Commission, in 1872, "in the centre of the Bay of Fundy, east of Grand Manan, in 95 to 106 fathoms" (Verrill). In the Gulf of St. Lawrence adult and living specimens of it were dredged by the writer in 1871, 1872 and 1873, at several localities to the north-east, south-east and south of the Island of Anticosti, in from 100 to 300 fathoms.

PLATYHELMINTHES.

TURBELLARIA (PLANARIANS).*

DENDROCELA.

Family *Leptoplanidae*.

LEPTOPLANA ELLIPSOIDES, Girard.

Grand Manan, "found at low-water, under stones, in 4 fathoms, nullipores, and in 30 fathoms shelly bottom" (Stimpson). Le Have Bank, Nova

*Extracted almost exclusively from Professor Verrill's paper on the "Marine Planarians of New England," in the Transactions of the Connecticut Academy of Arts and Sciences, vol. VIII., pp. 459-520, published in December, 1892.

Scotia, in 45 fathoms, gravelly and stony bottom, U. S. Fish Commission, 1872 (Smith and Harger).

"Gulf of St. Lawrence to Casco Bay, low-water to 60 fathoms. Common at Eastport, Me., and Grand Manan, N.B., 1862 to 1872, at low-water mark, under stones, in tide-pools and at all depths down to 40 fathoms, on stony bottoms. Halifax, N.S., 8 to 10 fathoms, 1877" (Verrill).

Family *Planariidae*.

FOVIA AFFINIS (Ersted).

"I have taken only a single specimen of a dark green variety (referred doubtfully to this species) at Eastport, Me., and Grand Manan, N.B., during many seasons spent in studying the fauna of that region" (Verrill).

PROCERODES ULVÆ (Ersted).

"New Haven to Bay of Fundy. Found near low-water mark, under stones and in tide-pools, among algæ" (Verrill).

ACELA.

Family *Aphanostoma*.

Doubtful Species.

TYPHLOCOLAX ACUTUS (Girard).

Typhlolepta acuta (Girard) Stimpson (1853).

Typhocolax acutus, Verrill (1892).

Grand Manan, "found in considerable numbers creeping over the surface of *Chirodota laevis*" (Stimpson).

NEMERTEA.*

ENOPLA.

Family *Amphiporidae*.

AMPHIPORUS ANGULATUS (Fabricius).

Fasciola angulata, O. Fabricius, in O. F. Müller (1774).

Planaria angulata (Fabricius) Müller (1776); and Fabricius (1780).

Omatoplex Stimpsoni (Girard) Stimpson (1853).

Amphiporus Stimpsoni, Verrill (1879).

Amphiporus angulatus, Verrill (1892).

Grand Manan, common at low-water mark under stones (Stimpson).
"Massachusetts Bay to Gulf of St. Lawrence, Labrador, Cumberland Gulf,

* Extracted largely from Professor Verrill's "Marine Nemerteans of New England, etc.", in the Transactions of the Connecticut Academy of Arts and Sciences, vol. VIII, pp. 382-456, published in June, 1892.

and Greenland. Very common and of large size at low-water mark, under stones, at Eastport, Me., and Grand Manan, N.B. I have also dredged it in numerous localities off Nova Scotia; in the Bay of Fundy; off the coast of Maine; Casco Bay; off Cape Ann; off Cape Cod, etc., in 4 to 150 fathoms; and in the Gulf of St. Lawrence, 15 fathoms" (Verrill).

AMPHIPORUS HETEROSORUS, Verrill.

"Bay of Fundy, in 10 to 200 fathoms, on muddy and sandy bottoms" (Verrill).

AMPHIPORUS LACTIFLOREUS (Johnston).

Planaria lactiflora, Johnston (1828).

Amphiporus lactiflorus, M'Intosh (1873); and Verrill (1879).

"Grand Manan, N.B., at low-water mark, under stones. This species, which is here referred, with some doubt, to the European form, is not uncommon on the shores of the Bay of Fundy" (Verrill).

AMPHIPORUS ROSEUS (Müller).

Fasciola rosea, Müller (1774).

Planaria rosea, Müller (1776).

Amphiporus roseus, Verrill (1892).

"Massachusetts Bay to Bay of Fundy, in various localities, low-water to 112 fathoms" (Verrill). The specimens described in Professor Verrill's paper were taken off Grand Manan, in 112 fathoms, in 1877.

AMPHIPORUS AGILIS, Verrill.

Ophionemertes agilis, Verrill (1873).

Amphiporus agilis, Verrill (1879).

"Bay of Fundy, 10 to 90 fathoms" (Verrill).

AMPHIPORUS (?) SUPERBUS (Girard).

Nareda superba (Girard) Stimpson (1853).

Amphiporus (?) superbus, Verrill (1892).

Grand Manan, "dredged in 35 fathoms in the Hake Bay," by Stimpson, but not since met with at this locality by Verrill.

TETRASTEMMA CANDIDUM (Fabricius ?) M'Intosh.

"Common at many localities between tides, among algæ, hydroids and bryozoa, from New Haven, Conn., to the Bay of Fundy." "Also dredged at moderate depths, 1 to 14 fathoms, in many localities" (Verrill).

TETRASTEMMA SERPENTINUM (Girard) Stimpson.

Grand Manan, "under stones, in the higher levels of the littoral zone" (Stimpson), but not included by Verrill in his paper on the New England Nemerteans.

TETRASTEMMA VITTATUM, Verrill.

"Bay of Fundy, etc., low-water mark to 25 fathoms, common on muddy bottoms" (Verrill).

Family *Drepanophoridae*.**DREPANOPHORUS LANKESTERI**, Hubrecht.

H.M.S. Challenger, Station 49 (May 20, 1873), south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones (Hubrecht).

ANOPLA.Family *Lineidae*.**LINEUS VIRIDIS** (Fabricius).

Planaria viridis (Fabricius) Müller (1776 and 1777); and Fabricius (1780).

Polia obscura (Girard) Stimpson (1853); no description.

Lineus viridis, Johnston (1865); et auct.

"Grand Manan, common in the first subregion of the littoral zone" (Stimpson). Halifax, N.S., Gulf of St. Lawrence, etc. "It is particularly abundant and large at Eastport, Me., and at all localities about the Bay of Fundy where the shore is composed of rocks" (Verrill).

LINEUS SANGUINEUS (Rathke).

Planaria sanguinea, Rathke (1799).

Lineus sanguineus McIntosh (1873).

"Grand Manan, between tides, in 1870 and 1872, common" (Verrill).

LINEUS SOCIALIS (Leidy).

Nemertes socialis, Leidy (1855).

Lineus socialis, Verrill (1892).

Bay of Fundy, a "strictly littoral species," which "occurs abundantly and usually gregariously under stones, among living mussels, between the roots of grasses and algae, etc., from near low-water mark nearly up to high-water mark of medium tides" (Verrill).

*Doubtful species.***(LINEUS TRUNCATUS (Hubrecht).***Cerebratulus truncatus*, Hubrecht (1887).*Lineus truncatus*, Verrill (1892).

H.M.S. "Challenger," Stations 47 and 49 (1873), off Nova Scotia, in 75 and 85 fathoms (Hubrecht). Verrill says that there is nothing in Hubrecht's description of *Cerebratulus truncatus* to distinguish it from *Lineus viridis*, which often contracts into the same form.)

MICRURA AFFINIS (Girard).*Poseidon affinis* (Girard) Stimpson (1853).*Nemertes affinis*, Verrill (1874).*Micrura affinis*, Verrill (1879).

Grand Manan, "in the laminarian zone" (Stimpson). "Very common from off Cape Cod and Massachusetts Bay to Nova Scotia, in 8 to 100 fathoms or more, on shelly and stony bottoms. It is particularly common in the Bay of Fundy, the harbour of Eastport, Me., and the other cold waters of that region, where it is also often found at low-water mark under stones" (Verrill).

MICRURA RUBRA, Verrill.

"Bay of Fundy, off Head Harbour, Campo Bello Island, 40 fathoms mud, Aug. 27, 1870" (Verrill).

CEREBRATULUS FUSCUS (Fabricius).*Planaria fusca*, O. Fabricius (1780).*Meekelia olivacea*, Rathke (1843).*Cerebratulus fuscus*, Verrill (1892).

Eastport, Me.; Grand Manan, N.B.; and Halifax, N.S.; "under stones and in sand and gravel near low-water mark, and beyond in shallow water to 20 fathoms or more" (Verrill). Dredged by Packard in 1860, at Salmon Bay, P.Q. (near the mouth of the Esquimaux River, on the north shore of the Gulf of St. Lawrence), in 10 fathoms mud; also, in 1864, in Belles Amours, Bradore Bay, P.Q., in 8 fathoms sand, and at Henley Harbour, Labrador (nearly opposite Belle Isle) in 20 fathoms. Greenland (Fabricius, and Levinson).

CEREBRATULUS CYLINDRICUS, Packard.

Belles Amours Harbour, Bradore Bay, P.Q., one specimen (Packard).

CEREBRATULUS LUBIDUS, Verrill.

Bay of Fundy; off Halifax, N.S., &c., common (Verrill).

Doubtful species.

CEREBRATULUS MEDULLATUS, Hubrecht.

H.M.S. Challenger, Station 49 (May 20, 1873), south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones. "This species is probably not a *Cerebratulus*" as here defined, "but more likely belongs to *Lineus* or *Micrura*, and perhaps to some of the species described above." (Verrill.)

Family *Cephalothricidae*.

CEPHALOTHRIX LINEARIS (Rathke).

Planaria linearis, Rathke (1799).

Cephalothrix linearis, (Erdstedt (1844); et auct.

"Long Island Sound to Nova Scotia, at many localities, between tides, under stones and in sand" (Verrill).

CHÆTOPODA.*

POLYCHÆTA.

Family *Serpulidae*.

SPIRORBIS BOREALIS, Daudin (?).

Serpula spirorbis, L. (1767).

? *Spirorbis spirillum*, Gould (1841); non L.

Spirorbis borealis (Daudin ?) Verrill (1873).

The commonest species of *Spirorbis* on the shores of the Gulf of St. Lawrence, attached to algæ, stones, shells, &c. It occurs in very shallow water, and ranges, on the north American side of the Atlantic, from Newhaven, Conn., to Labrador. Sir J. W. Dawson has found it fossil, in the Pleistocene deposits at Rivière du Loup, attached to shells.

"Whether this, our most common species, be identical with the European species known by this name is still uncertain. The animals of the various species of *Spirorbis* are still very imperfectly known, and many species have been described from the tubes alone. Accurate descriptions or figures of the animals are necessary before the species can be determined satisfactorily" (Verrill).†

* With the exception of the *Serpulidae*, all the specimens in this list that are stated to have been dredged by the writer, have been either identified or described by Professor W. C. McIntosh, LL.D., F.R.S., &c., of the University of St. Andrews, Scotland.

† U. S. Fish Commission, Report for 1871 and 1872 (1873), page 621.

SPIRORBIS LUCIDUS (Montagu).

Serpula porrecta, O. Fabricius (non Müller).

Serpula sinistrorsa, Montagu (1808).

Serpula lucida, Montagu (1808).

Spirorbis lucidus, Fleming, et auct. (Verrill).

Grand Manan, "found chiefly on Sertulariæ and other corallines" (Stimpson); Bay of Fundy, 10 to 80 fathoms, on hydroids (Verrill); Le Have Bank, N.S., in 45 fathoms, U. S. Fish Commission, 1872, (Smith and Harger); Gulf of St. Lawrence, at Gaspé Bay and many other localities, collected by Sir J. W. Dawson, Dr. R. Bell and the writer; Henley Harbour, Strait of Belle Isle, at a depth of 4 fathoms, on algæ (Packard).

Fossil in the Pleistocene deposits at Rivière du Loup, on the inside of shells (Sir J. W. Dawson).

This species forms small, translucent, glossy, reversed spiral tubes, coiled in an elevated spire, the last whorls usually turned up, or even erect and free (Verrill).*

SPIRORBIS VITREUS (Fabricius).

Serpula vitreu, O. Fabricius (1780).

Spirorbis vitreus, Dawson (1860); et auct.

Grand Manan, on a *Pecten* in 20 fathoms (Stimpson); Gaspé (Bell), Little Métis (Sir J. W. Dawson), Strait of Belle Isle, in 40 to 50 fathoms, and along the whole coast of Labrador (Packard); Greenland (Fabricius).

As a Pleistocene fossil this species has been found at Rivière du Loup, Murray Bay, Beauport and Montreal (Sir J. W. Dawson).

"*S. vitreus* is like *S. sinistrorsus*" (now called *S. vitreus*), "a reversed species, but is thick, semi-transparent, and has the whorls closely crowded, and in adult shells turned up and somewhat narrowed and thickened at the mouth. A group of these shells looks like a number of small drops of glass that had fallen on a stone and cooled there" (Sir J. W. Dawson).†

SPIRORBIS CANCELLATUS (Fabricius).

Serpula cancellata, O. Fabricius (1780).

Spirorbis cancellata, Dawson (1860).

Abundant at depths of less than 100 fathoms at many localities in the Gulf and mouth of the River St. Lawrence, where it has been dredged by Sir J. W. Dawson, Dr. R. Bell and the writer. Strait of Belle Isle, on a stony bottom,—and common on the whole coast of Labrador (Packard); Greenland, (Fabricius).

* U. S. Fish Commission, Report for 1871 and 1872 (1873), page 622.

† Canadian Naturalist and Geologist (1860), vol. v., p. 26.

Although so common in a living state, *S. cancellatus* has not yet been found in the Pleistocene deposits of eastern Canada.

SPIRORBIS GRANULATUS (Müller).

Serpula granulata, Müller (1776); and O. Fabricius (1780).

Spirorbis granulatus, Stimpson (1853); Dawson; and Packard.

Grand Manan, "common on stones, shells and the carapaces of crabs, in 20 to 50 fathoms;" Stimpson. "Found of large size along the whole coast of Labrador," in 10 to 40 fathoms (Packard); Greenland (Fabricius).

According to Sir J. W. Dawson, *S. granulatus* resembles *S. cancellatus*, "but wants the ornament around the margin, having only two furrows and three sharp elevated ridges on the upper side." "Fabricius, who found it in Greenland, states that its animal is yellow, with a white stopper on a short stalk, and six respiratory filaments."*

SPIRORBIS CARINATUS, Montagu.

Spirorbis carinata (Montagu), Dawson (1860).

"*Spirorbis carinata* (Mont.) is a deep water species, closely allied to *S. nautiloides*, if not a variety of it. It is distinguished by a keel or ridge running along the whorls, nearer the inner than the outer edge. In some old shells a second ridge appears, and then the shell very closely resembles *S. quadrangularis* of Stimpson. Young shells, on the other hand, are not distinguishable. This species is noted by Fabricius as a Greenland shell. It abounds in the collections of Mr. Bell of the Geological Survey, and in my own from Gaspé, where it occurred in deep water, attached to dead shells and stones. It was found at Labrador by Mr. Carpenter. I also have it on a stone taken up from the Banks of Newfoundland by a fisherman's hook, and presented to me by A. Dickson, Esq." (Sir J. W. Dawson, 1860, *Canad. Nat. and Geol.*, vol. v., p. 26).

More recently, in 1893, Sir J. W. Dawson says of this species: This "is a *Spirorbis* with one carina, found also in the Gulf of St. Lawrence, and possibly the same with the *S. contortuplicata* of Fabricius from Greenland; Little Métis."

"Fossil—Rivière du Loup, on shells."†

SPIRORBIS QUADRANGULARIS, Stimpson.

1853. *Synops. Marine Invert.* Grand Manan, p. 29.

Grand Manan, taken in 10 fathoms on stones (Stimpson). Described from the shells only.

* *Canadian Naturalist and Geologist* (1860), vol. v., p. 27.

† *The Canadian Ice Age, &c.*, Montreal, 1893, p. 260.

SPIRORBIS STIMPSONI, Verrill.

1879. Proc. U. S. Nat. Mus., vol. II., p. 181.

Spirorbis nautiloides, Verrill; non Lamarck.

"Massachusetts Bay to Nova Scotia, common in 10 to 80 fathoms, on shells and stones" (Verrill). If the specimens that Dr. Stimpson identified with *S. nautiloides*, Lamarck, are *S. Stimpsoni*, then this latter species has been found in the Bay of Fundy. Sir J. W. Dawson regards *S. Stimpsoni* as synonymous with *S. glomerata*, (Müller) which latter, he says, has been found fossil in the Pleistocene deposits at Gaspé, Rivière du Loup, Little Métis and Labrador.

SPIRORBIS VALIDUS, Verrill.

1872. Trans. Conn. Acad. Arts and Sc., vol. III., p. 44.

La Have Bank, near Cape Sable, Nova Scotia, in 45 and 60 fathoms, U. S. Fish Commission, 1872 (Smith and Harger).

VERMILIA SERRULA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 29.

Grand Manan, "frequent on the test of *Ascidia callosa*, and sometimes on *Pecten* from deep water" (Stimpson). Since dredged at many localities in the Gulf and mouth of the River St. Lawrence, at moderate depths, attached to stones, shells, &c., by Sir J. W. Dawson, Dr. R. Bell and the writer; also in the Strait of Belle Isle, at a depth of 50 fathoms, by Packard.

Fossil at Rivière du Loup, on shells, Sir J. W. Dawson; who thinks that it is "quite likely the Greenland species identified by Fabricius with *Serpula triquetra*," L.

PROTULA MEDIA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 50.

Grand Manan, "on muddy and gravelly bottoms in the coralline zone, attached almost invariably to dead valves of *Pecten Magellanicus*" (Stimpson). Off Grand Manan, 30 to 50 fathoms (Verrill).

PROTULA AMERICANA, M'Intosh.

1885. H.M.S. Challenger Reports, Zoology, vol. XII., p. 512.

H.M.S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones.

Family *Sabellidae*.

SABELLA PAVONINA, Savigny.

Grand Manan (Stimpson); Gulf of St. Lawrence, off Cap des Rosiers lighthouse, in 125 fathoms (Whiteaves); Greenland (Fabricius, under the name *Tubularia penicillus*).

SABELLA ZONALIS, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 30.

Grand Manan, "in four fathoms among nullipores, the specimens taken having their tubes thickly coated with mud" (Stimpson).

POTAMILLA OCULIFERA (Leidy).

Sabella oculifera, Leidy (1855).

Potamilla oculifera, Verrill (1873).

"Bay of Fundy, from low-water mark to 60 fathoms" (Verrill; who says that it is "closely related to *P. reniformis* of northern Europe, and possibly identical with it)." Le Have Bank, off Cape Sable, N.S., in 45 fathoms, U. S. Fish Commission, 1872 (Smith and Harger).

POTAMILLA NEGLECTA, Malmgren.

Le Have Bank, N.S., in 45 fathoms, very abundant; and in 60 fathoms, abundant, U. S. Fish Commission, 1872 (Smith and Harger).

POTAMILLA TORELLI, Malmgren.

H.M.S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones (M'Intosh).

CHONE INFUNDIBULIFORMIS, Kröyer.

Dredged by the writer in 1872, in the Gulf of St. Lawrence, seven miles E. by S. of Cap des Rosiers, in 110 fathoms, coarse sand and stones; between Griffins Cove and Cap des Rosiers, in 150 fathoms, mud; and about 10 miles from Cap des Rosiers, in 160 to 170 fathoms, mud and stones.

Family *Terebellidae*.

TEREBELLIDES STROEMII, M. Sars.

Bay of Fundy, 10 to 90 fathoms, muddy bottom (Verrill); Gulf of St. Lawrence, dredged by the writer in 1871 at various localities to the north, south and south-east of the Island of Anticosti, in from 100 to 112 fathoms.

ARTACAMA PROBOSCOIDEA, Malmgren.

Dredged by the writer in 1873, in the Gulf of St. Lawrence, a little to the north of the Baie des Chaleurs, between Cap D'Espoir and Grand Pabou, in 50 fathoms.

THELEPUS CININNATUS (Fabricius).

Amphitrite cincinnata, O. Fabricius (1780).

Lumara flava, Stimpson (1853); fide Verrill.

Thelepus cincinnatus, Malmgren (1867).

Grand Manan, "dredged in 35 fathoms in the Hake Bay. Tubes thin, of a light-yellowish colour, usually with pebbles attached to the outer surface" (Stimpson). Le Have Bank, Nova Scotia, in 45 to 60 fathoms; U. S. Fish Commission, 1872 (Smith and Harger). Gulf of St. Lawrence, north, south and south-east of the Island of Anticosti, in from 100 to 112 fathoms, dredged by the writer in 1871.

THELEPUS CININNATUS, var. CANADENSIS, M'Intosh.

H.M.S. Challenger Reports, Zoology, vol. XII., p. 469.

H.M.S. Challenger, Station 48 (May 8, 1873) near Le Have Bank, Nova Scotia, 51 fathoms, rock (M'Intosh).

TEREBELLA BRUNNEA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 31.

Grand Manan. "It inhabits thick-walled tubes, formed of mud and sand, which are found in great numbers on the under surfaces of large stones, near low-water mark" (Stimpson).

AMPHITRITE CIRRHATA (Müller) Packard.

"Caribou Island, Strait of Belle Isle, eight fathoms, sandy bottom. Cateau Harbour, Long Island. Common along the whole coast" of Labrador. "It constructs its tubes of fine sand" (Packard).

GRYMÆA SPIRALIS, Verrill.

1874. Amer. Journ. Sc. and Arts, Third Series, vol. VII., p. 407.

"Dredged in 1872, off Grand Manan Island, Bay of Fundy, in 60 fathoms" (Verrill).

Family *Ampharetidae*.

MELINNA CRISTATA (Sars).

Sabellides cristata, M. Sars (1856).*Melinna cristata*, Malmgren (1865).

Bay of Fundy, on muddy bottoms, in 10 to 90 fathoms (Verrill).

AMPHARETE GRUBEI, Malmgren.

Henley Harbour, Strait of Belle Isle, in 4 fathoms, not uncommon (Packard).

AMPHARETE GRACILIS, Malmgren.

Bay of Fundy, 10 to 90 fathoms (Verrill).

Family *Amphictenidae*.

CISTENIDES GRANULATA (L.).

Pectinaria Greenlandica, Grube.

Common throughout the entire region, and northward, from near low-water mark to a depth of 50 fathoms, or more.

CISTENIDES HYPERBOREA, Malmgren.

Dredged by the writer, in 1873, in the Gulf of St. Lawrence, a little to the north of the Baie des Chaleurs, between Cap D'Espoir (Despair) and Grand Pabou, in 50 fathoms, also between Anticosti and the Gaspé peninsula, in from 110 to 220 fathoms.

Family *Ammocharidae*.

OWENIA (or AMMOCHARIS) FILIFORMIS, Della Chiaje.

Dredged by the writer, in 1873, to the S.S.W. of the east point of Prince Edward Island; between Port Hood (Cape Breton) and the E. point of P.E.I.; between Cape George, N.S., and Port Hood; to the N.E., and N.E. by E., of Cape George; also between Anticosti and the Gaspé peninsula, in 110 to 220 fathoms.

Family *Maldanidæ*.

PRAXILLA MULLERI (Sars).

Clymene Mulleri, M. Sars (1856).*Praxilla Mulleri*, Malmgren (1865).

Chateau Bay, Strait of Belle Isle, 30 to 40 fathoms, in hard sand; and
 Cateau Harbour, Long Island, Labrador, in 15 fathoms, sand (Packard).

PRAXILLA GRACILIS, Sars.

Gulf of St. Lawrence, from various localities to the north, south and
 south-east of the Island of Anticosti, in from 100 to 112 fathoms, collected
 by the writer in 1871.

NICOMACHE LUMBRICALIS (Fabricius).

Sabella lumbricalis, O. Fabricius (1780).*Clymene lumbricalis*, Stimpson (1853).*Nicomache lumbricalis*, Malmgren (1865).

Grand Manan, "tubes adherent to stones, shells, &c., in deep water"
 (Stimpson). Off Caribou Island, P.Q., in 8 fathoms, sand. "This species
 constructs its tube of fine sand, a little more than a line in thickness and
 two and a half inches long" (Packard).

AXIOTHEA CATENATA, Malmgren.

Dredged by the writer, on the Bradelle Bank, in 1873.

CLYMENELLA TORQUATA (Leidy).

Clymene torquata, Leidy (1855).*Clymenella torquata*, Verrill (1873).

Bay of Fundy, low-water to 60 fathoms (Verrill).

MALDANE SARSII, Malmgren.

Gulf of St. Lawrence, dredged by the writer and determined by Professor
 M'Intosh.

Family *Cirratulida*.

CIRRATULUS CIRRHATUS (Fabricius).

Lumbricus cirratus, O. Fabricius (1780).*Terebella cirrata*, Stimpson (1853).*Cirratulus cirrata*, Packard (1867).

Grand Manan, "in deep water, chiefly on shelly bottoms, in 20-40 fathoms" (Stimpson). "Taken from the stomach of a codfish caught in 10 fathoms, Strait of Belle Isle, off Belles Amours" (Packard); Greenland (Fabricius).

Family *Spionidae*.

SCOLECOLEPIS CIRRATA (Sars). Var.

Nerine cirrata, M. Sars (1856).*Scolecoclepis cirrata*, Malmgren (1865).

Gulf of St. Lawrence, dredged by the writer and determined by Professor M'Intosh. See H.M.S. Challenger Reports, Zoology, vol. XII., p. 380.

PRIONOSPION STEENSTRUPI, Malmgren.

Dredged by the writer in the deep sea mud (from 110 to 220 fathoms) between Anticosti and the Gaspé peninsula, in 1872; and between the Bradelle Bank and Miscou Island, in 45 fathoms, mud and stones, in 1873.

POLYDARA CONCHARUM, Verrill.

1880. Proc. U.S. Nat. Museum, vol. II., p. 174.

"Very common all along the coast, from Cape Cod to Nova Scotia, in 10 to 100 fathoms, in tortuous, narrow galleries excavated in shells, especially of *Cyprina Islandica*; also in decayed wood dredged in 32 fathoms off Cape Cod. Collected by the writer in the Bay of Fundy in 1863, 1864, 1865, 1870, and subsequently at various localities while dredging for the U. S. Fish Commission in 1872, 1873, 1877, 1878 and 1879" (Verrill).

Family *Chaetopteridae*.

SPIOCHAETOPTERUS TYPICUS, Sars.

Chateau Bay, Strait of Belle Isle, in 30 to 40 fathoms, hard sandy bottom. "Several fragments of tubes were also found fossil in the quaternary beds at Caribou Island" (Packard).

Family *Telethusa*.

ARENICOLA PISCATORUM, Lamarck.

Grand Manan, "common on sandy shores above low-water mark, especially where there are scattered boulders" (Stimpson). "A specimen was found in the stomach of a codfish, taken in 15 to 20 fathoms, at Belles Amours," on the northern side of the Strait of Belle Isle (Packard).

Family *Chloroemidae*.

SIPHONOSTOMUM ASPERUM, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 31.

Grand Manan Island, "dredged in the Hake Bay, on a shelly bottom, in 25 fathoms" (Stimpson). Salmon Bay, east of Esquimaux Bay, on the north shore of the Gulf of St. Lawrence, just inside of the Strait of Belle Isle, "at a depth of 10 fathoms, on a muddy bottom" (Packard).

TECTURELLA FLACCIDA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 32.

Grand Manan Island, "among nullipores and shells in 3-15 fathoms. A few specimens, which must be very closely allied to, if not identical with the *Siphonostomum vaginiferum* of Rathke, described at length by R. Leuckart, in Wiegman's Archiv. for 1849, vol. I., p. 164" (Stimpson).

BRADA GRANOSA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 32.

Grand Manan, "on sandy bottoms in 4-6 fathoms" (Stimpson).

BRADA SUBLEVIS, Stimpson.

1853. Op. cit., p. 32.

Grand Manan, "dredged on nullipore and muddy bottoms in the laminarian zone" (Stimpson).

TROPHONIA PLUMOSA (Müller).

Amphitrite plumosa, Müller (1776); and O. Fabricius (1780).

Trophonia plumosa, Johnston (1865).

Siphonostomum plumosum, Packard (1867).

Off Cap des Rosiers lighthouse, in 125 fathoms, dredged by the writer in 1871. "Dredged at Caribou Island, in 8 fathoms of water, on a sandy bottom," by Dr. A. S. Packard in 1860, and determined by the late Dr. Stimpson.

Family *Sphaerodoridae*.

EPHESIA GRACILIS, Rathke.

Gulf of St. Lawrence, off Cap des Rosiers lighthouse, in 125 fathoms, dredged by the writer with the preceding species.

Another species of *Ephesia* (apparently from the writer's dredgings in the Gulf of St. Lawrence) is mentioned but not described, under the name *E. Canadensis*, by Professor M'Intosh, on page 362, of the twelfth volume of the Zoological Reports of H.M.S. Challenger.

Family *Scalibregmidae*.

EUMENIA CRASSA, CErsted.

Dredged by the writer, in 1872, between Anticosti and the Gaspé peninsula, in from 110 to 220 fathoms.

SCALIBREGMA INFLATUM, Rathke.

Dredged by the writer, with the preceding species, in deep water, between Anticosti and the Gaspé peninsula, in 1872; also, on the Orphan Bank, in 1873.

Family *Opheliidae*.

AMMOTRYPANE AULOGASTER, Rathke.

Gulf of St. Lawrence, off Cap des Rosiers lighthouse, in 125 fathoms, and at several localities to the north, south and south-east of the Island of Anticosti, in from 100 to 112 fathoms; dredged by the writer in 1871.

AMMOTRYPANE FIMBRIATA, Verrill.

1873. U. S. Fish Comm. Rep. for 1871-72, p. 604.

Bay of Fundy, 10 to 90 fathoms mud (Verrill).

OPHELIA LIMACINA, Rathke.

N.N.E. of Shediac Island, N.B., in 5 fathoms, sand, dredged by the writer in 1873.

OPHELIA GLABRA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 33.

Grand Manan, "dredged on muddy bottoms in deep water" (Stimpson).

Family *Ariciidae*.

NAIDONEREIS QUADRICUSPIDA, Blainville (fide Verrill).

Aricia quadricuspis (?) Grube ; fide Stimpson (1853).

Naidonereis quadricuspidata, Verrill (1879).

Grand Manan, "the small specimen taken was too much injured for certainty of reference" (Stimpson).

SCOLOPLOS CANADENSIS, M'Intosh. (M. S.)

Off Port Hood, Cape Breton Island, dredged by the writer in 1873.

Family *Glyceridae*.

RHYNCHOBOLUS CAPITATUS (Ersted).

Glycera capitata, (Ersted (1843) ; and Stimpson (1853).

Rhynchobolus capitatus, Verrill (1874).

Grand Manan, "at low-water mark, under stones, on sandy shores" (Stimpson).

Family *Goniadidae*.

GONIADA MACULATA, Ersted.

Glycera viridescens, Stimpson (1853) ; fide Verrill.

Grand Manan (Stimpson) ; Bay of Fundy, 20 to 70 fathoms (Verrill) ; off Chebucto Head, Halifax Harbour, in 20 fathoms, U. S. Fish Commission, 1872 (Smith and Harger). Gulf of St. Lawrence, at several localities to the north, south and south-east of the Island of Anticosti, in from 100 to 112 fathoms, dredged by the writer in 1871.

Family *Onuphidae*.

LEODICE VIVIDA (Stimpson).

Eunice vivida, Stimpson (1853).

Leodice vivida, Verrill (1873).

Grand Manan (Stimpson).

NOTHRIA CONCHYLEIA (Sars).

Onuphis conchylegia, Sars (1835).

Onuphis Eschrichtii, (Ersted (1843) ; Stimpson (1853) ; and Packard (1867).

Nothria conchylegia, Malmgren (1867) ; et auct.

Grand Manan, "taken on shelly bottoms in the coralline zone." "The tube is broad, flat and composed of large angular fragments of shells and chips

of slaty stones" (Stimpson). Le Have Bank, Nova Scotia, in 45 fathoms, very abundant,—and in 60 fathoms, abundant, U. S. Fish Commission, 1872, (Smith and Harger). H.M.S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones. "In the instances from Station 49, the tubes are composed of fragments of shells with a few stones, and therefore are in contrast with those from the Gulf of St. Lawrence, Canada, which (tubes) are almost wholly formed of small stones" (M'Intosh). Common at many localities in the Gulf of St. Lawrence, at moderate depths, down to 125 fathoms, dredged by the writer in 1871, 1872, and 1873. North shore of the Gulf of St. Lawrence at Salmon Bay, in 15 fathoms; and Chateau Bay, Strait of Belle Isle, in 25 to 30 fathoms; also Cateau Harbour, coast of Labrador, in 15 fathoms sand (Packard).

ONUPHIS SICULA, De Quatrefages.

Gulf of St. Lawrence, Whiteaves (M'Intosh).

Family Eunicidæ.

EUNICE ERSTEDII, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 34.

Grand Manan, "dredged in 20 fathoms on a shelly bottom, off the northern point of Duck Island" (Stimpson). H.M.S. Challenger, Station 49 (May 20, 1873), south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones (M'Intosh).

Family Lumbrinereidæ.

LUMBRICONEREIS FRAGILIS (Müller).

Lumbricus fragilis, O. F. Müller (1776).

Lumbriconeris fragilis, (Ersted (1843).

Lumbrinereis fragilis, Malmgren (1867).

Bay of Fundy and Atlantic coast of Nova Scotia, from low-water mark to 430 fathoms (Verrill). Gulf of St. Lawrence, about half way between the S. W. point of the Island of Anticosti and the Gaspé peninsula, in 200 fathoms, mud, dredged by the writer in 1871.

Family Nereidæ.

NEREIS (LYCORIS) PELAGICA, L.

Helicronereis arctica (Ersted) Packard.

Everywhere throughout the entire region, from low-water mark to 106 fathoms, or more. Bay of Fundy (Verrill); Nova Scotia, Le Have Bank

(Smith and Harger); and H.M.S. Challenger, Station 49 (M'Intosh). Occurs frequently from Anticosti, to Square Island, (Labrador) in 10 to 30 fathoms (Packard); Greenland (Ersted).

A fossil specimen, in a nodule from Green's Creek, near Ottawa, has been referred to this species by Sir J. W. Dawson.

NEREIS VIRENS, Sars.

Nereis grandis, Stimpson (1853); vide Verrill.

Grand Manan, "at low-water, under large stones" (Stimpson). New Haven, at low-water, northward to Labrador (Verrill).

NEREIS ABYSSICOLA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 33.

Grand Manan, in 40 fathoms mud, off Long Island (Stimpson).

NEREIS IRIS, Stimpson.

1853. Op. cit., p. 33.

Grand Manan, in 20 fathoms north of Duck Island. "It was found in a thin leathery tube, encased with small pebbles" (Stimpson).

NEREIS DENTICULATA, Stimpson.

1853. Op. cit., p. 33.

Grand Manan, at low-water mark (Stimpson).

Family *Syllidae*.

EUSYLLIS TUBIFEX, Gosse.

H.M.S. Challenger, dredged near Station 48 (May 8, 1873) off Le Have Bank, Nova Scotia, on a rocky bottom, in 51 fathoms (M'Intosh).

Family *Phyllodoctidae*.

ETEONE CYLINDRICA, Ersted.

North shore of the Strait of Belle Isle, at Belles Amours, in 5 fathoms of water, on a muddy bottom (Packard).

PHYLLODOCE GREENLANDICA, Örsted.

Grand Manan, "not uncommon in 25 fathoms, shelly bottom, back of Duck Island. A large bright green species" (Stimpson). Frequent at Caribou Island, in 8 fathoms sand; at Belles Amours, in 5 fathoms, mud; and at Square Island, Labrador, in 15 to 20 fathoms, on a shelly bottom (Packard).

PHYLLODOCE CATENULA, Verrill.

1873. U. S. Fish Comm. Rep. for 1871 and 1872, p. 587.

"Very common in the Bay of Fundy, from low-water to 50 fathoms" (Verrill).

Family *Nepthydidae*.

NEPHTHYS CILIATA (Müller).

Nereis ciliata, O. F. Müller (1776).

Nephtys borealis, Örsted (1843).

Nephtys ciliata, Rathke (1843).

Grand Manan, dredged in 25 fathoms mud, near Duck Island, and in 40 fathoms mud, off Long Island. "The specimens found were mostly jet black" (Stimpson). Gulf of St. Lawrence, abundant, dredged by the writer and identified by Professor M'Intosh.

NEPHTHYS CÆCA (Fabricius).

Nereis caeca, O. Fabricius (1780).

Nephtys caeca, Örsted (1843); et auct.

Gulf of St. Lawrence, dredged by the writer and identified by Professor M'Intosh. "Abundant on the whole coast" (of the north shore of the Gulf of St. Lawrence, just inside of the Strait of Belle Isle, and of Labrador), "especially the young, which were dredged in deep, soft mud, in Salmon Bay and Belles Amours," P.Q., "in from 5 to 20 fathoms, and at Cateau Harbour," Labrador, "in 15 fathoms, sand. Chateau Bay, 30 fathoms, hard sandy bottom" (Packard).

NEPHTHYS LONGISETOSA, Örsted.

"Off Anticosti, Mr. Whiteaves" (M'Intosh); and dredged by Packard at Belles Amours, at a depth of 5 fathoms, on a muddy bottom.

NEPHTHYS INCISA, Malmgren.

Nephtys ingens, Stimpson; fide Verrill.

Grand Manan, in deep water, one specimen (Stimpson). Bay of Fundy, 10 to 60 fathoms, Verrill; who says that it is the "most common and abundant species on muddy bottoms along the whole New England coast." It occurs at all depths from 2 to 430 fathoms."

NEPHTHYS PICTA, Ehlers.

Dredged by the writer, in the Gulf of St. Lawrence, off Cap Bon Ami, six miles from shore, on a stony bottom, in 30 fathoms, in 1871; also between Cape Gaspé and Cap des Rosiers, in 75 to 80 fathoms, stones, in 1872.

NEPHTHYS CANADENSIS, M'Intosh.

1900. Ann. and Mag. Nat. Hist., Ser. vii., vol. v., p. 264.

Dredged by the writer, in the Gulf of St. Lawrence, between Cape Gaspé and Cap des Rosiers, in 75 to 80 fathoms, and eight miles S.E. of Bonaventure Island, in 56 fathoms, in 1872; also, on the Bradelle Bank, in 1873; and described from these localities by Professor M'Intosh.

NEPHTHYS LAWRENCII, M'Intosh.

1900. Op. cit., p. 265.

Described from specimens dredged by the writer in the Gulf of St. Lawrence off Cape Gaspé and Cap des Rosiers, in 1872; also on the Bradelle Bank, and off Port Hood, Cape Breton, in 1873.

Family Sigalionidae.

PHOLOE MINUTA (Fabricius).

Aphrodite minuta, O. Fabricius (1780).

Pholoe minuta, (Eraté) (1843).

Gulf of St. Lawrence, Whiteaves (M'Intosh); and north shore of the Gulf, at Belles Amours Harbour, Bradore Bay, just inside the Strait of Belle Isle, on a muddy bottom, in eight fathoms (Packard).

PHOLOE TECTA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 36.

Grand Manan, "dredged in 4 fathoms, on a bottom of coarse sand and nullipores" (Stimpson).

LEANIRA TETRAGONA, Ersted.

Dredged by the writer in the Gulf of St. Lawrence, off Cap des Rosiers, in 110 fathoms on coarse sand and stones in 1872; and between Anticosti and the Gaspé peninsula in 110 to 220 fathoms, in 1873.

LEANIRA YHLENI, ? Malmgren.

Off the S. W. Point of Anticosti, in 210 fathoms, 1873 (Whiteaves).

STHENELAIS LIMICOLA, Ehlers.

Gulf of St. Lawrence (Whiteaves) M'Intosh.

Family *Polynoidæ*.

HARMOTHOE IMBRICATA (L.)

Aphrodita imbricata, L. (1767).

Aphrodita cirrata, Muller (1776); and O. Fabricius (1780).

Lepidonote cirrata, (Ersted (1843); and Stimpson (1853).

Harmothoe imbricata, Malmgren (1865).

Grand Manan, taken about low-water mark; of a bright pink or violet colour (Stimpson); "in the Bay of Fundy it is common from above low-water mark to 60 fathoms" (Verrill). Nova Scotia, on the Le Have Bank, in 45 and 60 fathoms; and off Chebucto Head, Halifax Harbour, in 20 fathoms, U. S. Fish Commission, 1872 (Smith and Harger). North shore of the Gulf of St. Lawrence, at Caribou Island, in 8 fathoms, sand; Atlantic coast of Labrador, at Sloop Harbour, twenty-five miles south of Cape Harrison, in 6 to 8 fathoms, sand, common; at Cateau Harbour, in 15 fathoms sand; and at Sandwich Bay, Dumplin Harbour, in 4 fathoms (Packard). Probably common throughout the whole region.

"This species is very variable in the colour of its scales (elytra), which in some individuals are uniformly pale, in others partially red, while others have a central spot, and a broad dark, curved band" (Packard).

POLYNOE GASPÉENSIS, M'Intosh.

1874. Ann. and Mag. Nat. Hist., Ser. iv., vol. XIII., p. 267.

This species was described from specimens dredged by the writer in 100 to 212 fathoms off the Island of Anticosti, and in various parts of the Gulf of St. Lawrence, in 1872.

NEMIDIA (?) LAWRENCII, M'Intosh.

1874. Op. cit., p. 266.

Gulf of St. Lawrence, Whiteaves, (M'Intosh).

NEMIDIA (?) CANADENSIS, M'Intosh.

1874. Op. cit., p. 265.

Gulf of St. Lawrence, Whiteaves (M'Intosh.)

EUPOLYNOE ANTICOSTIENSIS, M'Intosh.

1874. Op. cit., p. 265.

"Dredged rather abundantly" by the writer "in various parts of the Gulf of St. Lawrence, in 1873."

EUPOLYNOE OCCIDENTALIS, M'Intosh.

1874. Op. cit., p. 264.

? *Eucranta villosa* (Malmgren) Verrill.

Gulf of St. Lawrence, dredged by the writer in 1872, off Cape Gaspé and Cap des Rosiers, in 110 fathoms, stones and coarse sand, but only one imperfect specimen was obtained. Professor Verrill thinks that *E. occidentalis* is identical with *Eucranta villosa*, Malmgren.

ANTINOE SARSII, Kinberg.

Gulf of St. Lawrence, not uncommon, Whiteaves (M'Intosh).

MALMGRENIA WHITEAVESII, M'Intosh.

1874. Op. cit., p. 263.

A single small specimen, about a quarter of an inch long, dredged between Anticosti and the Gaspé peninsula, in 110 to 220 fathoms, was detected in one of the collections forwarded to Professor M'Intosh by the writer.

LAGISCA RARISPINA (Sars).

Le Have Bank, Nova Scotia, U. S. Fish Commission, 1872, Smith and Harger (Verrill).

LAGISCA RARISPINA, var. OCCIDENTALIS, M'Intosh.

1874. Op. cit., p. 262.

Gulf of St. Lawrence, collected by the writer and described by Professor M'Intosh.

EUNOA NODOSA, (Sars).

Le Have Bank, Nova Scotia, in 45 and 60 fathoms, U. S. Fish Commission, 1872, Smith and Harger (Verrill); Gulf of St. Lawrence, Whiteaves (M'Intosh).

EUNOA CERSTEDI, Malmgren.

Dredged by the writer on the Orphan Bank, opposite the mouth of the Baie des Chaleurs, in 1872.

EUNOA SPINULOSA, Verrill.

1880. Proc. U.S. Nat. Museum, vol. II., p. 169.

"Sable Island Bank, off Nova Scotia, Captain McPhee, schooner Carl Schurz, November, 1878 (U. S. Fish Commission)," Verrill.

NYCHIA CIRRHOSA (Pallas).

Le Have Bank, Nova Scotia, in 45 fathoms, U. S. Fish Commission, 1872, Smith and Harger (Verrill). Gulf of St. Lawrence, abundant in the writer's dredgings (M'Intosh).

NYCHIA AMONDSeni, Malmgren.

Gulf of St. Lawrence, rather plentiful in the writer's collections. "A specimen of *Selenium polynoe*, Kröyer, was attached to the ventral aspect of a foot of one" (M'Intosh).

LEPIDONOTUS SQUAMATUS (L.).*Aphrodita squamata*, L. (1767).*Aphrodite punctata*, Müller (1776).*Polynoe squamata*, Gould (1841).*Lepidonote punctata*, (Ersted (1843).*Lepidonotus squamatus*, Malmgren (1865).

Throughout the entire region, abundant, from above low-water mark to a depth of 80 fathoms.

Family *Aphroditidae*.

LETMONICE FILICORNIS, Kinberg.

One or two examples of this species were recognized by Professor M'Intosh in the writer's Gulf of St. Lawrence dredgings in 1871-73.

LETMONICE ARMATA, Verrill.

1879. Proc. U. S. Nat. Museum, vol. II., p. 169.

"Common on muddy bottoms in the Bay of Fundy and Gulf of Maine, in 50 to 150 fathoms. Collected first in 1864, 1865 and 1868," by Professor Verrill and S. I. Smith, "and subsequently by the U. S. Fish Commission, in many localities."

"It differs from *L. filicornis*, with which it was formerly identified by me, not only in having a much smaller median antenna, but also in the character of the setae, especially those of the ventral fascicule. Whether the Gulf of St. Lawrence specimens, recorded by M'Intosh as *L. filicornis*, belong to this species, is uncertain" (Verrill).

LETMONICE PRODUCTA, Grube, var. ASSIMILIS, M'Intosh.

1885. H.M.S. Challenger Reports, Zoology, vol. XII., p. 4.

H.M.S. Challenger, dredged at Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones.

APHRODITA ACULEATA, L.

Grand Manan, "a fine large species, often four inches in length, which is taken occasionally in deep water" (Stimpson); Bay of Fundy, 10 to 106 fathoms, mud (Verrill). Gulf of St. Lawrence, several young examples, in the writer's 1871-73 collections (M'Intosh).

Family *Euphosynidae*.

SPINTHER CITRINUS (Stimpson).

Cryptonota citrina, Stimpson (1853).

Spintner citrinus, M'Intosh (1874).

Grand Manan, "dredged on a gravelly and somewhat muddy bottom, in 35 fathoms in the Hake Bay" (Stimpson).

EUPHROSYNÉ BORREALIS, CErsted.

Grand Manan, "it frequents muddy bottoms" (Stimpson). H.M.S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones. Not in Mr. Whiteaves' dredgings" (M'Intosh).

(*Incertæ sedis*).

ENONELLA BICARINATA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 34.

Grand Manan, "found in fine sand at low-water mark, at High Duck Island" (Stimpson).

GEPHYREA.

CHÆTIFERA.

STERNASPIS FOSSOR, Stimpson.

1853. Synops. Marine Invert. Gr. Manan, p. 29.

Grand Manan, on muddy bottoms in the coralline zone (Stimpson). Common in the Bay of Fundy in 10 to 90 fathoms, mud (Verrill, 1873).

ACHÆTA.

PHASCOLOSOMA CÆMENTARIUM (De Quatrefages).

Phascolosoma Bernhardus, Pourtales (1852).

Sipunculus Bernhardus, Stimpson (1853); non Forbes.

Sipunculus cæmentarius, De Quatrefages (1866).

Phascolosoma cæmentarium, Verrill (1873).

Grand Manan, "common in the coralline zone, in shells of *Dentalium* especially" (Stimpson). Bay of Fundy, 2 to 90 fathoms, abundant (Verrill). Le Have Bank, N.S., in 45 fathoms (Smith and Harger). Common in the shells of small gasteropoda, such as *Lunatia*, *Bela*, and especially *Nassa trivittata*, everywhere between Prince Edward and Cape Breton islands and throughout Northumberland Strait. Dredged by the writer in 1873, and determined by Professor Verrill.

PHASCOLOSOMA HAMULATUM, Packard.

1867. Mem. Boston Soc. Nat. Hist., vol. 1., p. 290.

"But one specimen was taken in eight fathoms, Caribou Island, Strait of Belle Isle, inhabiting a dead shell of *Aporrhais occidentalis*" (Packard). "Perhaps the same as *P. cæmentarium*" (Verrill).

PHASCOLOSOMA BORREALE, Keferstein.

1874. Proc. Amer. Assoc. Adv. Sc. for 1873, p. 387.

"Gulf of St. Lawrence, Whiteaves," 1872. "The types are from Greenland" (Verrill).

PHASCOLION TUBICOLA, Verrill.

Phascolosoma tubicola, Verrill (1873).

Phascolion tubicola, Selenka and de Man (1883).

H.M.S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms.

PRIAPULUS CAUDATUS? Lamarck.

Holothuria priapus of Linné, and O. Fabricius.

Specimens that have been referred to this species, but with some doubt as to the accuracy of the identification, were dredged by the writer, in 1873, off Cape George, N.S., and at the entrance to Gaspé Bay.

PRIAPULUS PYGMÆUS, Verrill.

1879. Proc. U.S. Nat. Museum, vol. II., p. 182.

Bay of Fundy, 4 to 5 fathoms, soft mud, U. S. Fish Commission, 1872 (Verrill). Specimens dredged by the writer off Port Hood, Cape Breton, which seems to differ from those here referred, with doubt, to *P. caudatus*, may be referable to *P. pygmaeus*.

BRACHIOPODA**ARTICULATA.****Family Terebratulidae.*****TEREBRATULINA SEPTENTRIONALIS (Couthouy).**

Terebratula septentrionalis, Couthouy (1839).

Terebratula caput serpentis, Gould (1841).

Terebratulina septentrionalis, Gould (1870).

Grand Manan, common (Stimpson); Passamaquoddy Bay, dredged in 12 fathoms in Friars Cove, and Beaver Harbour (Charlotte County) N.B. (Ganong). Halifax Harbour, common (Willis,—and J. M. Jones); Le Have Bank, in 45 and 60 fathoms, and off Chebucto Head, Halifax Harbour, in 20 fathoms (Smith and Harger); H.M.S. Challenger, Station 49, south of Halifax, in 85 fathoms (Davidson, 1880). In the Gulf of St. Lawrence, a

few specimens were dredged by the writer, off Charleton Point, Anticosti, in 120 fathoms, and off the Fast Point Lighthouse, twenty-four miles distant, in 212 fathoms, in 1871; also between Anticosti and the Gaspé peninsula, in from 200 to 220 fathoms, in 1873. Rev. Canon Norman regards *T. septentrionalis* as only a variety of *T. caput serpentis*, and the supposed "thin, silvery fibrous epidermis" of the former, as a "hispid coating of sponge."*

TEREBRATALIA SPITZBERGENSIS (Davidson).

Terebratella Spitzbergensis, Davidson (1852).

Waldheimia cranium, Willis (1863); non Müller, sp.

Terebratalia Spitzbergensis, Beecher (1895).

St. Margaret's Bay (about twenty-five miles west of Halifax), N.S., one specimen, the *Waldheimia cranium* of Willis' list.† In the Gulf of St. Lawrence, *T. Spitzbergensis* has been dredged, but always sparingly, by the writer, off Percé, in Gaspé Bay, off Cape Gaspé, Cap des Rosiers, Charleton Point, Anticosti, and other places, in from 30 to 120 fathoms; and by Sir J. W. Dawson, at Murray Bay, in from 20 to 25 fathoms. The species seems to be circumpolar, as it has been taken also at Greenland, Spitzbergen, the Shetlands, and northern Japan. In Canada, it has been found fossil in the Leda clay at Rivière du Loup.

TEREBRATELLA LABRADORENSIS (Sowerby).

Terebratula Labradorensis, Sowerby.

Terebratella Labradorensis, Davidson.

"In the British Museum, from Labrador. C. Goodsir" (Sowerby). "Stimpson, Fishery Banks, rare" (Willis). "Type in British Museum, species requiring more investigation (Davidson, 1880). Sowerby's figure of this species represents a small terebratuloid shell, with a large foramen to the ventral, and the dorsal radially plicate. In the writer's judgment, its occurrence on the Labrador and Nova Scotian coast needs confirmation.

Dall, in a recent letter to the writer, says: "I have never seen it, and suspect it was a very young specimen of the very variable *T. caurina*, Gould (= *T. transversa*, Sowerby). "Anyhow I should reject it as N.E. American."

Terebratella Frielei, Davidson, has been recorded by Jeffreys as occurring near Halifax, in 1,340 fathoms, but that locality is obviously too far from land to come within the limits of this paper).

* In *Annals and Magazine of Natural History*, Series Six, vol. XII., pp. 441-442.

† "In a MS. of Stimpson's in my possession he notes that Willis' *W. cranium* is a var. of *T. Spitzbergensis*, from examination of Willis' specimen." Dall, in letter dated March 20, 1901.

Family *Rhynchonellidae*.

HEMITHYRIS PSITTACEA (Gmelin).

Anomia psittacea, Gmelin (1792).*Rhynchonella psittacea*, Owen (1835); et auct.*Hemithyris psittacea*, Orbigny (1847).*Hypothyris psittacea*, King (1850).

Abundant and gregarious throughout the whole region, usually on a stony or rocky bottom. In the Gulf and mouth of the River St. Lawrence it has been taken at many localities, at depths of from about 10 to 50 or 60 fathoms, but on the Labrador coast it has been dredged in as shallow water as one fathom. In 1896, Mr. A. P. Low collected large and perfect valves of it on the beach at Richmond Gulf, on the east coast of Hudson Bay. It has long been known to be a circumpolar species, with a very wide distribution on both sides of the north Atlantic and Pacific.

In eastern Canada *H. psittacea* has been found fossil in the Pleistocene of Anticosti, Rivière du Loup, Beauport and Montreal; also at Tertiary Bay, Labrador, by Packard; at Cape Hope (Drexler) and Mill Point, near Moose Factory, James Bay, by Bell; and at the Limestone Rapids of the Fawn Branch of the Severn River, Keewatin, by Low in 1886.

On page 1248 of the Appendix to Dr. Paul Fischer's "Manuel de Conchyliologie" Dr. Ehlert gives "Est du Canada" as one of the localities for *Cistella cistellula* (Searles Wood), but does not state exactly where, when or by whom, it was collected. He also, on the same page, cites Labrador as a locality for *Atrétia gnomon*, though he subsequently states, on page 1308 of the same volume, that Deslongchamps considers *Atrétia* to be the fry of *Rhynchonella (Hemithyris) psittacea*.

POLYZOA.

CHEILOSTOMATA.

Family *Eucratiid*.

GEMELLARIA LORICATA (L.)

Sertularia loricata, L. (1758).*Gemellaria loricata*, Busk (1852).*Gemellaria Willisii*, Dawson (1865).

"Very common in Casco Bay and Bay of Fundy, low-water to 110 fathoms" (Verrill, 1873). Sable Island (*G. Willisii*); Sir J. W. Dawson. Dredged at many localities in the Gulf of St. Lawrence by the writer in 1871-73. It occurs also on the coast of British Columbia, and is probably circumpolar.

GEMELLARIA LORICATA, var. AMERICANA.

Gemellaria dumosa, Stimpson (1853).

Gemellaria loricata, var. *Americana* (Lamoureux); Verrill (1879).

Grand Manan, "dredged in 10 fathoms, off Cheney's Head, on a coarse, sandy, and somewhat weedy bottom" (Stimpson).

SCRUPARIA CLAVATA, Hincks.

"Abundant in St. Lawrence dredgings, on *Crisia*" (Hincks).

Family Cellularidae.

CELLULARIA PRACHII, Busk.

Bay of Fundy (Verrill). Specimens dredged in the Gulf of St. Lawrence by Sir J. W. Dawson and the writer, have been identified with this species by Rev. T. Hincks and Canon Norman. Caribou Island,—“it occurred rarely on *Pecten* in 50 fathoms; Henley Harbour, Strait of Belle Isle, in 4 fathoms; and Hopedale, Labrador, in 10 fathoms, rocky bottom (Packard).

MENIPEA TERNATA (Ellis and Solander.)

Grand Manan, "found in 20 fathoms, shelly bottom, in the Hake Bay" (Stimpson); common in Casco Bay, Bay of Fundy, and at St. George's Bank, 6 to 100 fathoms" (Verrill). Dredged at many localities in the Gulf of St. Lawrence, in from 10 to 112 fathoms, by Sir J. W. Dawson and the writer. Caribou Island, P.Q., in 8 fathoms; and Strait of Belle Isle, in 50 fathoms (Packard). According to Hincks,* the Gulf of St. Lawrence specimens are referable to the var. *gracilis*. (= *M. gracilis*, Busk). The typical form, Hincks says, has been dredged at the Queen Charlotte Islands, B.C., by Dr. G. M. Dawson.

SCRUPOCELLARIA SCRUPOSA (L.)

Specimens dredged in the Gulf of St. Lawrence in 1871 and 1872, have been identified with this species by the writer. But Verrill says that he has seen no American examples of *S. scruposa*.†

SCRUPOCELLARIA AMERICANA, Packard.

1863. Canad. Nat. and Geol., vol. VIII., p. 409.

Bank off Caribou Island, P.Q.; Belles Amours, on the north side of the Strait of Belle Isle, in 8 fathoms; and Square Island, Labrador, in 10 to 30 fathoms; common (Packard).

* British Marine Polyzoa, vol. I., pp. 39 and 40.

† Proceedings of the United States National Museum, vol. II., (1880) p. 190.

SCRUPOCELLARIA SCABRA (Van Beneden).

Gaspé Bay (Hincks); Orphan Bank, dredged by the writer in 1873, and identified by the Rev. Canon Norman. According to Smitt, this is *Sertularia halecina* of O. Fabricius.

CABEREA ELLISII (Fleming).

Flustra Ellisii, Fleming.

Caberea Hookeri, Busk (1852).

Caberea Ellisii, Smitt (1867).

"Very common in Casco Bay, Bay of Fundy, and St. George's Bank, 6 to 100 fathoms" (Verrill). Between Pictou Island and Cape Bear, P.E.I., abundant; Orphan Bank and elsewhere, at many localities in the Gulf of St. Lawrence, in 10 to 60 fathoms, common. Caribou Island, Packard, who says that it is abundant on the Labrador coast. In the north Pacific it has been dredged at Vancouver and the Queen Charlotte Islands by Dr. G. M. Dawson.

Family *Bicellariidae*.

BICELLARIA CILIATA (L.).

North Shore of the Gulf of St. Lawrence, half way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms, stones and coarse sand, dredged by the writer in 1871.

BUGULA MURRAYANA (Johnston).

Menipea fruticosa, Packard (1863).

Flustra truncata, Stimpson (1853); fide Verrill.

Grand Manan, "common in 4 fathoms, on nullipore bottoms, among the smaller islands" (Stimpson). Very common throughout the Gulf of St. Lawrence, where it has been dredged by Sir J. W. Dawson, Packard, Bell and the writer. The species is known also to occur off the coast of Greenland and in Davis Strait, and it has been dredged at Vancouver and the Queen Charlotte Islands by Dr. G. M. Dawson.

Bugula fastigiata, L. (= *Acamarchis plumosa* (Pallas) Busk) which according to Verrill, ranges from Massachusetts Bay to Labrador, and which Fabricius found in Greenland, is recorded by Packard at having been dredged by him on the Atlantic coast of Labrador, at Thomas Bay, in 15 fathoms. The St. Lawrence specimen that the writer referred to *Acamarchis plumosa* in 1871 and 1872 is *Kinetoskias arborescens*.

KINETOSKIAS SMITII, Danielssen.

Bugula flexilis, Verrill (1875).*Kinetoskias flexilis*, Verrill (1879).*Kinetoskias Smittii*, Verrill (1879).*Kinetoskias (Bugulopsis) flexilis*, Verrill (1885).

"It occurs in deep water (194 fathoms) off the coasts of Maine and Nova Scotia" Verrill (Norman).

KINETOSKIAS ARBORESCENS, Danielssen.

Bugula umbella, Smitt (1867).

Gulf of St. Lawrence, between the east end of the Island of Anticosti and the Bird Rocks, in 212 fathoms, mud; one specimen (on a small stone) dredged by the writer in 1871 and subsequently identified with this species by the Rev. Canon Norman.

BEANIA ADMIRANDA, Packard.

Off Caribou Island; it occurred rarely on *Pecten* in 50 fathoms (Packard).

CORYNOPORELLA TENUIS, Hincks.

1888. Ann. and Mag. Nat. Hist., Ser. vi., vol. i, p. 215

Gulf of St. Lawrence, forming small tufts attached to other Polyzoa" (Hincks).

Family *Flustridae*.

FLUSTRA BOREALIS (Packard).

Halophila borealis, Packard (1863).*Flustra borealis*, Verrill (1879).

"But one tuft of this interesting species occurred" (off Caribou Island) in 50 fathoms, "associated with *Beania admiranda*, on a fragment of *Pecten*" (Packard).

FLUSTRA MEMBRANACEO-TRUNCATA, Smitt.

Common in the Gulf of St. Lawrence, on shells, stones, &c., at moderate depths, but Professor Verrill thinks it merely a variety of the preceding species. Dr. G. M. Dawson has dredged similar specimens at the Queen Charlotte Islands, on the Pacific coast of Canada.

FLUSTRA CARBASEA, Ellis and Solander.

Flustra digitata, Packard, 1867.

Flustra papyrea, Smitt (1867); non *Eschara papyrea*, Pallas, fide Hincks.

"Gulf of St. Lawrence, Dawson" (Hincks); Chateau Bay, N. side of the Strait of Belle Isle, in 30 fathoms, not uncommon (Packard).

In his "British Marine Polyzoa" (vol. 1, p. 120), Hincks records *F. securifrons*, Pallas (*F. truncata*, L.) as occurring frequently in South Labrador, on the authority of Packard. But, Verrill states that Stimpson's *F. truncata* is *Bugula Murrayana*, and it may be that Packard's is also.

FLUSTRA SOLIDA, Stimpson.

1853. Synopsis. Marine Invert. Grand Manan, p. 19.

Eschara palmata, Sars (1867).

Flustrinomorpha solida, Verrill (1879).

Grand Manan, "dredged in 25 fathoms, off the northern point of Duck Island" (Stimpson). One fine specimen was dredged by the writer, in 1871, in the Gulf of St. Lawrence, off Bear Head, Anticosti, in 120 fathoms.

FLUSTRA SERRULATA, Busk.

"Murray Bay (Sir J. W. Dawson). An arctic species collected by Nares" (Hincks).

FLUSTRA ABYSSICOLA, G. O. Sars.

Gulf of St. Lawrence, S.W. by S. of the S.W. Point of Anticosti, in 220 fathoms, mud; one adult specimen, dredged by the writer in 1873.

Family Membraniporidae.

ELECTRA PILOSA (L.)

Flustra pilosa, L. (1761).

Membranipora pilosa, Farris (1837); et auct.

Electra pilosa, Norman (1894).

Atlantic coast of Nova Scotia (Sir J. W. Dawson); Bay of Fundy (Verrill). Between Cape Breton and Prince Edward Island, dredged by the writer in 1873, and determined by Rev. Canon Norman. Northern portion of the Gulf of St. Lawrence, at several localities, collected by Sir J. W. Dawson, and the writer. Caribou Island, "especially abundant encircling fronds of *Desmarestia* just below low-water mark" (Packard). Fossil at St. John, N.B. (Matthew).

ELECTRA CATENULARIA (Jameson).*Tubipora catenularia*, Jameson.*Hippothoa catenularia*, Fleming (1822).*Hippothoa rugosa*, Stimpson (1853); fide Verrill.*Electra catenularia*, Norman (1894).

Common throughout the entire region. Professor Verrill thinks that it is only a variety of *E. pilosa*.

Fossil in the Pleistocene of Rivière du Loup, Beauport and Labrador (Sir J. W. Dawson).

MEMBRANIPORA CYMBIFORMIS, Hincks.

1888. Ann. and Mag. Nat. Hist., Ser. vi., vol. 1., p. 217.●

Gulf of St. Lawrence, "in small patches incrusting Hydroids and Polyzoa" (Hincks). Specimens that have been identified with this species by the Rev. Canon Norman, were dredged by the writer between Cape Breton and Prince Edward Island, on the Orphan Bank, and in Gaspé Bay.

MEMBRANIPORA LINEATA, L.

Bay of Fundy (Verrill); Gaspé Bay, and other localities in the Gulf of St. Lawrence (Sir J. W. Dawson, and the writer). "Frequent in from 10 to 50 fathoms, Strait of Belle Isle" (Packard).

Fossil in the Pleistocene deposits of Rivière du Loup (Sir J. W. Dawson).

MEMBRANIPORA CRATICULA, Alder.

Gaspé Bay, on shells, dredged by Sir J. W. Dawson, and the writer, and identified by Rev. T. Hincks and Canon Norman. Off Cap des Rosiers, in 38 fathoms, Whiteaves (Norman); Métis, Sir J. W. Dawson (fide Norman).

MEMBRANIPORA UNICORNIS, Fleming.

Gulf of St. Lawrence (Norman); Queen Charlotte Islands, B.C., Dr. G. M. Dawson (Hincks).

MEMBRANIPORA DUMERILII (Audouin).

Gaspé Bay, Sir J. W. Dawson (Norman).

MEMBRANIPORA SOPHIE, Busk.

Gaspé Bay, on dead shells, &c., collected by Sir J. W. Dawson, and the writer; and Métis, Sir J. W. Dawson (1877) fide Norman.

MEMBRANIPORA SOPHIE, var. ARMIFERA.

Membranipora armifera, Hincks (1880, Ann. and Mag. Nat. Hist.,
Ser. v., vol. vi., p. 82.)

Gulf of St. Lawrence, "on shell and stones, and incrusting *Flustra membranaceo-truncata*, Smitt." (Hincks). Eight miles S.E. of Bonaventure Island, in 56 fathoms, Whiteaves; and Métis, Sir J. W. Dawson; (fide Norman).

MEMBRANIPORA LACROIXII (Audouin).

Marsouin, on the "north coast of Gaspé," in about 30 fathoms, attached to dead shells and stones; dredged by Dr. R. Bell in 1858, and determined by Sir J. W. Dawson. Gulf of St. Lawrence, Whiteaves (Hincks).

MEMBRANIPORA TRIFOLIUM (Searles Wood).

Flustra trifolium, Searles Wood (1850).
Membranipora solida, Packard (1863).
Membranipora sacculata, Norman (1864).
Membranipora Flemingii, forma *trifolium*, Smitt (1867).

Gulf of "St. Lawrence, Dawson" (Hincks); Gaspé Bay, Whiteaves (Norman); near Caribou Island (types of *M. solida*) Packard.

RAMPHONOTUS MINAX (Busk).

Membranipora minax, Busk (1860).
Membranipora Flemingii, forma *minax*, Smitt (1867).
Ramphonotus minax, Norman (1894).

"Gulf of St. Lawrence, Whiteaves" (Norman).

Family Cribrilinidae.

CRIBRILINA PUNCTATA (Hassall).

Lepralia punctata, Hassall (1841); and Johnston (1849).

First identified by Sir J. W. Dawson in 1859, from specimens dredged at Marsouin by Dr. R. Bell in 1858. Gaspé Bay, and elsewhere in the Gulf of St. Lawrence, in from 30 to 50 fathoms, dredged by the writer in 1869, and 1871-73. Gulf of St. Lawrence, "frequent on dead shells of *Ceronia deaurata*, &c., associated with *C. annulata*, *Schizoporella hyalina*, and *Membranipora*" (Hincks).

Fossil in the Pleistocene deposits at Rivière du Loup (Sir J. W. Dawson).

CRIBRILINA ANNULATA (Fabricius).

Cellepora annulata, O. Fabricius (1780).*Lepralia annulata*, Johnston (1849).*Escharipora annulata*, Smitt (1868).

Grand Manan, "dredged in deep water, encrusting shells, &c." (Stimpson). Gulf of St. Lawrence, at Gaspé Bay and elsewhere, dredged by Sir J. W. Dawson, and the writer. "A group of three cells, with two spines on each side of the distal margin, occurred in the Strait of Belle Isle; also in Cateau Harbour, Long Island" (Labrador coast) "in 15 fathoms" (Packard).

MEMBRANIPORELLA CRASSICOSTA, Hincks.

1888. Ann. and Mag. Nat. Hist., Ser. VI., vol. I., p. 216.

Gulf of St. Lawrence. "Spreads in reddish-brown patches over various kinds of Polyzoa, *Escharoides Sarsii*, &c." (Hincks). A. W. Waters regards this species as a *Membranipora* and places it in the family Membraniporidae.*

Family *Microporellidae*.

MICROPORELLA CILIATA (Pallas).

Lepralia ciliata (Johnston) Packard (1867).*Porcellina ciliata* (Smitt) Verrill (1879).

Gaspé Bay, Sir J. W. Dawson, fide Norman (but with a query).

Family *Porinidae*.

PORINA TUBULOSA, Norman.

Lepralia tubulosa, Norman (1868).*Cylindroporella tubulosa*, Hincks (1877).

Not uncommon at many localities in the Gulf of St. Lawrence, where it has been dredged by Sir J. W. Dawson, and the writer. Métis (Sir J. W. Dawson, fide Norman).

LAGENIPORA SPINULOSA, Hincks.

1892. Ann. and Mag. Nat. Hist., Ser. VI., vol. IX., p. 156.

"This very interesting form occurs abundantly. It has only been noticed previously amongst Dr. G. M. Dawson's dredgings from the Queen Charlotte Islands. It is probably an Arctic form. The St. Lawrence specimens hitherto met with are all crustaceous in habit, overspreading the stems of Hydroids. The erect branching form obtained at the Queen Charlotte Islands has not occurred" (Hincks).

*Observations on Membraniporidae, Journ. Linn. Soc., Zool., vol. XXVI., p. 870.

Family *Myrionozoida*.

MYRIOZOOM SUBGRACILE, D'Orbigny.

Millepora truncata, Fabricius (fide Packard).*Myrionozoom subgracile* (Orbigny) Packard (1863).*Leieschara subgracile* (Norman) Verrill (1879).

Abundant and fine at many localities in the Gulf of St. Lawrence, at moderate depths, especially on fishing banks, and often associated with *Eschuroides Sarsii*, *Porella elegantula* and *Celleporaria surcularis*. It was first recognized as a Canadian species by Packard, who dredged specimens on the bank off Caribou Island, in 1862, and who says that it occurs also in the Bay of Fundy and on the Banks of Newfoundland.

Fossil in the Pleistocene of Rivière du Loup (Sir J. W. Dawson).

MYRIOZOOM PLANUM (Dawson).

Lepralia plana, Dawson (1859).*Myrionozoom crustaceum*, Smitt (1867); fide Hincks (1892).*

The types of *L. plana* were dredged at Marsouin, by Dr. Bell in 1858, and the species has since been found to be quite common in the Gulf of St. Lawrence.

It has also been found fossil in the Pleistocene of Rivière du Loup by Sir J. W. Dawson.

MYRIOZOOM COAROTATUM (Sars).

Leieschara coarotata, Sars.*Myrionozoom coarotatum*, Smitt (1867).

Le Have Bank, N.S., in 45 fathoms, gravelly and stony bottom, common, U. S. Fish Commission, 1872 (Smith and Harger). On the Pacific Coast this species has been dredged at Vancouver and the Queen Charlotte Islands, by Dr. G. M. Dawson, in 1878.

SCHIZOPORELLA LINEARIS (Hassall).

Lepralia linearis, Hassall (1841).*Lepralia lineata* (Hassall) Packard (1863.)

Near Caribou Island, rare (Packard). In the Proceedings of the U. S. National Museum for 1879 (vol. II., p. 193) Professor Verrill says that Hincks' genus *Schizoporella* (1879) is synonymous with *Escharina*, Edwards (1835).

* But, in the Annals and Magazine of Natural History for January, 1894, p. 127, (foot note), the Rev. Canon Norman says that *L. plana* is the same as *M. coarotatum*, Smitt.

SCHIZOPORELLA BIAPERTA (Michelin).

A specimen dredged by the writer in 1872, in the Gulf of St. Lawrence, eight miles to the S.E. of Bonaventure Island, in 56 fathoms, has been identified with this species by the Rev. Canon Norman.

SCHIZOPORELLA AURICULATA (Hassall).

Gulf of St. Lawrence (Hincks). Gaspé Bay, Dawson (Norman). Fifteen miles S.S.E. of Bonaventure Island, in 50 fathoms, Whiteaves, 1872 (Norman). Verrill regards this species as a *Smittia*.

SCHIZOPORELLA SINUOSA (Busk).

"Gulf of St. Lawrence, normal and var. *a*, Dawson" (Hincks); Gaspé Bay, Dawson (Norman).

SCHIZOPORELLA CRUENTA (Norman).

St. Lawrence (Hincks). Eight miles S.E. of Bonaventure Island, in 56 fathoms, Whiteaves, 1872; Gaspé Bay, and Métis, Sir J. W. Dawson, 1877 (Norman).

SCHIZOPORELLA HYALINA (L.).

Cellepora hyalina, L. (1767).

Cellepora nitida, O. Fabricius (1780).

Lepralia hyalina, W. Thompson; and Johnston.

Abundant at many localities in the Gulf and mouth of the River St. Lawrence, usually at moderate depths; but a specimen dredged by the writer in the deepest part of the Gulf, about half way between the Island of Anticosti and the Bird Rocks, in 313 fathoms, has been identified with this species by the Rev. Canon Norman.

Sir J. W. Dawson records *S. hyalina* as occurring, in a fossil state, in the Pleistocene of St. John, N.B.; of Rivière du Loup, and Beauport (P.Q.).

SCHIZOPORELLA CINCTA, Hincks. (Var.)

1892. Ann. and Mag. Nat. Hist., Ser. VI., vol. IX., p. 154.

Gulf of St. Lawrence (Hincks).

HIPPOTHOA DIVARICATA, Lamouroux.

Hippothoa borealis (d'Orbigny) Packard.

Common in the Gulf of St. Lawrence and on the coast of Labrador, where it has been dredged at many localities by Dr. Bell, Sir J. W. Dawson,

Packard, and the writer. This and the next two species were first recognized as Canadian by Sir J. W. Dawson in 1859, from specimens dredged by Bell, off Marsouin, in 1858.

HIPPOTHOA EXPANSA, Dawson.

Hippothoa divaricata, var. *expansa*, Verrill (1879).

The types of this species (or variety) are from Marsouin, and similar specimens have since been collected at many other localities in the Gulf of St. Lawrence, and in the Strait of Belle Isle, by Sir J. W. Dawson, Packard and the writer. Sir J. W. Dawson says that *H. expansa* has been found fossil in the Pleistocene of Rivière du Loup and Beauport.

Family Escharidae.

LEPRALIA PERTUSA (Esper).

Specimens dredged at Marsouin, off Anticosti and the Mingan Islands, near Caribou Island, on the Labrador coast, and at various localities in the Gulf of St. Lawrence, have been identified with this species by Sir J. W. Dawson in 1859, by Verrill in 1863, by Packard in 1863 and 1867, and by the writer in 1872. More recently (in 1892) Hincks has refigured the species from a St. Lawrence specimen, and Sir J. W. Dawson has recorded the occurrence of *L. pertusa* in the Pleistocene deposits of Rivière du Loup, Beauport and Labrador.

But, on the other hand, in 1879, Verrill writes:—"there appears to be great confusion in regard to the identification of *L. pertusa*, and doubtless several species have been confounded under that name. American writers have referred several distinct species to *pertusa*, and I am not sure that the genuine *pertusa* inhabits our coast. The species thus named by Dawson, on examination of specimens kindly furnished by him, proves to be *Smittia porifera*. Probably *S. candida* has also been identified as *pertusa* by some writers."*

LEPRALIA HIPPOPUS, Smitt.

"Gulf of St. Lawrence, Dr. Dawson"; and "Postpliocenè, Canada,—Dawson" (Hincks, 1880).

LEPRALIA SPATHULIFERA, Smitt.

Dredged by the writer in the Gulf of St. Lawrence,—eight miles S. E. of Bonaventure Island, in 56 fathoms, in 1872; off Grande Grève, Gaspé Bay,

* Proceedings of the U. S. National Museum for 1879, vol. II., p. 194.

in 1869; and off Cap des Rosiers, in 38 fathoms, in 1871. Some of the specimens from these localities were identified with this species by the writer, and others, quite independently, by the Rev. Canon Norman.

LEPRALIA (DISCOPORA) MEGASTOMA, Smitt.

Gulf of St. Lawrence (Norman).

UMBONULA VERRUCOSA (Esper).

? *Cellepora verrucosa*, Esper.

Lepralia verrucosa, W. Thompson; et auct.

Discopora verrucosa, Gray (1848).

Umbonula verrucosa, Hincks (1880).

Gaspé Bay, Sir J. W. Dawson (Norman); Greenland (Lutken).

ESCHAROIDES SARSII, Smitt.

Cellepora cervicornis, var., M. Sars.

Eschara rosacea, M. Sars (1862).

Eschara Sarsii, Busk.

Eschara lobata (Lamouroux) Packard.

Escharopsis lobata (Lamouroux) Verrill.

Very abundant throughout the Gulf of St. Lawrence, often associated with *Myriozeugum subgracile*, *Porella* (*Celleporaria*) *surcularis*, *Porella elegantula*, &c. It was first recorded as a Canadian species by Packard and Verrill, in the "Canadian Naturalist and Geologist" for December, 1863. Packard (who says that it occurs also in the Bay of Fundy) dredged it in from 10 to 20 fathoms in Salmon Bay, and in 50 fathoms on the bank off Caribou Island, in 1860; and Verrill off Anticosti and the Mingan Islands, in 1861. Since then, it has been taken at many other localities in the Gulf of St. Lawrence by Sir J. W. Dawson, and the writer, and on the Le Have Bank by the U. S. Fish Commission (Smith and Harger). Hincks, in 1892, described it as forming "large coral-like growths composed of many massive branching segments, springing from a common base, foliated, contorted, expanding upwards and terminating above in numerous smaller segments."*

PORELLA CONCINNA (Busk).

Lepralia concinna, Busk (1852).

Lepralia Belli, Dawson (1859).

Porella concinna, Hincks (1880).

Extremely abundant throughout the Gulf of St. Lawrence, at depths of from about 10 to 50 or 60 fathoms, or more, attached to shells, stones, &c.

* Annals and Magazine of Natural History, Ser. VI., vol. I., p. 220.

The types of *L. Belli* were dredged at Marsouin, in about 30 fathoms, by Dr. Bell, in 1858. In the *Annals and Magazine of Natural History* for January, 1894, (p. 127) the Rev. Canon Norman says that "Dawson's *L. Belli* = *Porella concinna*, not *P. bella*, as asserted by Hincks in his later paper." On the Pacific coast of Canada, *P. concinna* has been dredged at the Queen Charlotte Islands by Dr. G. M. Dawson. In a fossil state, it has been found in the Leda clay at Rivière du Loup by Sir J. W. Dawson.

PORELLA MINUTA (Norman).

Lepralia minuta, Norman (1868).

Porella minuta, Hincks (1880).

A specimen from Gaspé has been identified with this species by the Rev. Canon Norman.

PORELLA BELLA (Busk).

Lepralia bella, Busk (1860).

Smittia bella, Verrill (1879); and Hincks (1880).

Porella bella, Norman (1894).

"Gulf of St. Lawrence, Whiteaves" (Norman).

PORELLA ACUTIROSTRIS, Smitt.

1889. Hincks. *Ann. and Mag. Nat. Hist.*, Ser. VI., vol. III., p. 429.

Gulf of St. Lawrence (Hincks). Specimens dredged in Gaspé Bay by Sir J. W. Dawson, and off Bonaventure Island by the writer, have also been recognized by the Rev. Canon Norman as referable to this species.

PORELLA PROBOSCIDEA, Hincks.

1888. *Ann. and Mag. Nat. Hist.*, Ser. VI., vol. I., p. 223.

Gulf of St. Lawrence, dredged by the writer on the Orphan Bank, and off Cap des Rosiers, in 38 fathoms, "on shells and Hydroids, in small patches" (Hincks).

PORELLA STRUMA (Norman).

Hemeschara struma, Norman.

Porella struma, Hincks (1880).

Murray Bay, Sir J. W. Dawson (Norman).

PORELLA SKENEI (Ellis and Solander).

Millepora Skenel, Ellis and Solander (1786).

Cellepora Skenel, Johnston (1849).

Lepralia crassispina, Stimpson (1853); the Lepralian form, fide Verrill.

Discopora Skenel, Verrill (1879).

Grand Manan, "in small radiating patches on stones and shells from deep water" (Stimpson; *L. crassispina*). Le Have Bank, N.S., in 60 fathoms, U. S. Fish Commission, 1872 (Smith and Harger). Gulf of St. Lawrence, about one mile and three-quarters to the S.E. of Bonaventure Island, in 56 fathoms, sand (Whiteaves, 1872).

PORELLA SKENEI, var. PLANA, Hincks.

1888. Ann. and Mag. Nat. Hist., Ser. VI., vol. I., p. 221.

Described from specimens dredged by the writer, in 1871, on the north shore of the Gulf of St. Lawrence, half way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms, small stones and coarse sand.

PORELLA ELEGANTULA (Orbigny).

Eschara elegantula, Orbigny; Packard, et auct.

Porella elegantula, Levisen (1886); and Hincks (1888).

Common at many places in the Gulf of St. Lawrence. The writer has dredged it profusely on the Orphan Bank; to the S.E. and S.S.E. of Bonaventure Island; off Grande Grève, in Gaspé Bay; off Cap des Rosiers village, &c. Packard had previously dredged it, in abundance, on the bank off Caribou Island, in 1860.

Sir J. W. Dawson has found this species fossil in the Leda clay of Rivière du Loup, and T. Curry in the same formation at Montreal.

PORELLA ELEGANTULA, var. PAPPOSA.

Eschara papposa, Packard (1867).

Le Have Bank, N.S., in 45 fathoms, U. S. Fish Commission, 1872 (Smith and Harger). The types of *E. papposa* were dredged by Packard, in 1864, at Chateau Bay, Strait of Belle Isle, where the species is said to be "not unfrequently found with *Flustra digitata*" (*carbacea*).

PORELLA SURCULARIS (Packard).

Celleporaria surcularis, Packard (1863).

Celleporaria incrassata, Smitt (non Lamarck).

? *Porella compressa* (Sowerby) Hincks (1880).

Extremely common in the Gulf of St. Lawrence, especially upon fishing banks, or upon rocky, pebbly or shelly bottoms, in from 10 to 50 fathoms,

and often drifted down to lower levels. On the Orphan Bank, as many as from 50 to 100 perfect and fresh (if not living) specimens were brought up, in 1873, in a single haul of the dredge, and elsewhere they are equally abundant. The types of *C. surcularis* were dredged by Packard, in 1860, off Caribou Island, on stones and shells (not "stems and cells," as inadvertently printed) "in company with *Eschara*." Hincks, in his History of the British Marine Polyzoa, includes *C. surcularis*, Packard, with a query, among the synonyms of *Porella compressa* (Sowerby). But, as there seems to be some uncertainty in this reference, it is thought desirable, for the present, to retain Packard's specific name.

In a fossil state, *P. surcularis* has been found by Sir J. W. Dawson in the Pleistocene deposits at Rivière du Loup.

PORELLA LÆVIS (Fleming).

Collepore laevis, Fleming (1822).

Eschara laevis, M. Sars.

Two fine examples of this species were dredged on the Orphan Bank by the writer in 1863; and one specimen, in 56 fathoms, stones and coarse sand, eight miles to the S.E. of Bonaventure Island, in 1872.

PORELLA PROPINQUA, Smitt.

Gaspé Bay, Whiteaves (Norman).

SMITTIA LANDSBOROVII (Johnston).

Lepralia Landsborovii, Johnston (1849).

Gulf of St. Lawrence (Hincks, 1892) who writes thus concerning it. "Amongst the St. Lawrence dredgings the true typical form is not by any means common; the species is represented chiefly by the variety *porifera* of Smitt. One specimen has occurred to me which, in addition to the ordinary characteristics of *S. Landsborovii*, is furnished with the large spatulate avicularia, which are rarely developed and always in connection with the oecium."*

SMITTIA ARCTICA, Norman.

Escharella porifera, forma *minuscule* and forma *majuscula*; Smitt (1867).

Smittia Landsborovii, form *porifera* (Smitt) Hincks (1888).

Smittia arctica, Norman (1894).

Gulf of St. Lawrence (Hincks, 1888 and 1892). "Forma *majuscula*, Gulf of St. Lawrence, Sir J. W. Dawson; forma *minuscule*, Gulf of St. Lawrence, Whiteaves" (Norman, 1894). Orphan Bank, Gaspé Bay, &c.

* Annals and Magazine of Natural History, Ser. VI., vol. IX., p. 156.

SMITTIA CANDIDA (Stimpson).

Lepralia candida, Stimpson (1853).*Smittia candida*, Verrill (1879).

Grand Manan, "dredged on stones in 35 fathoms in the Hake Bay" (Stimpson); very common in the Bay of Fundy (Packard).

SMITTIA TRISPINOSA (Johnston).

Lepralia trispinosa, Johnston (1849).*Smittia trispinosa*, Hincks (1880).

This species was first recognized as Canadian by Sir J. W. Dawson, in 1859, from specimens dredged by Dr. Bell, in 1858, off Marsouin. Packard found similar specimens off Caribou Island, in 1860, and Verrill at the Mingan Islands and off Anticosti in 1861. *S. trispinosa* is now known to be common throughout the Gulf of St. Lawrence, and Sir J. W. Dawson collected specimens of it as far up the river as Murray Bay. It also occurs in the north Pacific, and Dr. G. M. Dawson has dredged it at three localities in the Queen Charlotte Islands.

It has been found fossil in the Leda clay at Rivière du Loup, by Sir J. W. Dawson.

SMITTIA PRODUCTA (Packard).

Lepralia producta, Packard (1863).*Smittia producta*, Hincks (1889).

The types of *L. producta* are from near Caribou Island, and the species has since been found at many localities in the Gulf of St. Lawrence by Sir J. W. Dawson, and the writer, and as far up the river as Murray Bay. The species was first described and figured by Packard, as a *Lepralia*, in the Canadian Naturalist and Geologist for December, 1863; and was subsequently re-described and re-figured by Hincks, as a *Smittia*, in the Annals and Magazine of Natural History for May, 1889.

Sir J. W. Dawson has found it fossil, in the Leda clay at Rivière du Loup.

SMITTIA GLOBIFERA (Packard).

Lepralia globifera, Packard (1863).*Smittia globifera*, Verrill (1879).

Near Caribou Island, "frequent, forming frosty white patches. It often encrusts Celleporæ, where the ovicells are much crowded, and the ridges between the radiating rows of cells obsolete. I have dredged it in the Bay of Fundy" (Packard). "Casco Bay to Labrador, common. It is very common in the Bay of Fundy and on the Grand Banks" (Verrill).

SMITTIA RETICULATOPUNCTATA, Hincks.

Specimens of a polyzoan dredged by the writer on the Orphan Bank and Gaspé Bay, have been identified with this species by the Rev. Canon Norman.

MUCRONELLA PEACHII (Johnston).

Lepralia Peachii, Johnston (1849).

Escharoides coccinea, var. *Peachii*, Verrill (1879).

First recognized as a Canadian species by Sir J. W. Dawson in 1859, from specimens dredged off Marsouin by Dr. Bell in 1858. Specimens dredged in Gaspé Bay have since been identified with this species by the writer and by the Rev. Canon Norman.

Fossil at Rivière du Loup (Sir J. W. Dawson).

MUCRONELLA VENTRICOSA (Hassall).

Lepralia ventricosa, Hassall.

Mucronella ventricosa, Hincks (1880).

Specimens of this species have been dredged in the Gulf of St. Lawrence at Gaspé Bay by Sir J. W. Dawson, and the writer; also off Bonaventure Island and Cap des Rosiers by the writer. The identification of specimens from each of these localities with *M. ventricosa*, has since been confirmed by the Rev. Canon Norman. Dr. G. M. Dawson has dredged similar specimens at the Queen Charlotte Islands, B.C.

Fossil at Rivière du Loup (Sir J. W. Dawson).

MUCRONELLA ABYSSICOLA (Norman).

Lepralia abyssicola, Norman (1868).

Gulf of St. Lawrence, Dawson (Hincks); Gaspé Bay, Whiteaves (Norman).

MUCRONELLA PAVONELLA (Alder).

Eschara pavonella, Alder.

Gulf of St. Lawrence, Dawson (Hincks); Gaspé Bay, Dawson (Norman); Queen Charlotte Islands, B.C., Dr. G. M. Dawson (Hincks).

MUCRONELLA PRÆLUCIDA, Hincks.

1888. Ann. and Mag. Nat. Hist., Ser. 21, vol. 1, p. 225.

Gulf of St. Lawrence, one specimen, (Hincks). The types of this species are from Houston Stewart Channel, at the southern extremity of the Queen Charlotte Islands, B.C., where specimens are said to be "not uncommon on shells."

MONOPORELLA SPINULIFERA, Hincks.*Mucronella spinulifera*, Hincks (1889).*Monoporella spinulifera*, Hincks (1892).

Gulf of St. Lawrence, on shells, stones, &c. (Hincks).

RHAMPHOSTOMELLA SCABRA (Fabricius).*Eschara scabra*, Fabricius (teste Smitt).*Millepora reticulata*, O. Fabricius (1780).*Cellepora scabra*, Smitt (1868).*Mucronella scabra*, Verrill (1879).*Rhamphostomella scabra*, Lorenz (1886).

Gaspé Bay, Dawson (Norman). Vineyard Sound to Greenland (Verrill).

RHAMPHOSTOMELLA SCABRA, var. LABIATA.*Lepralia labiata*, Stimpson (1853); fide Verrill.Grand Manan, "found on small pebbles from deep water" (Stimpson).
Near Caribou Island (Packard).**RHAMPHOSTOMELLA OVATA (Smitt).***Cellepora ovata*, Smitt.*Mucronella ovata*, Verrill (1879).*Rhamphostomella ovata*, Lorenz (1886).

Gaspé Bay, Dawson (Norman).

RHAMPHOSTOMELLA COSTATA, Lorenz.

"Smitt has ranked under his typical *Cellepora scabra* the present form, which has been rightly treated as a distinct species by Lorenz. It is abundant among the St. Lawrence dredgings, in company with *R. plicata*, Smitt, and *R. bilaminata*, Hincks" (Hincks, in *Annals and Magazine of Natural History* for May, 1889, p. 426). Specimens dredged by the writer on the Orphan Bank; fifteen miles S.S.E. of Bonaventure Island; in Gaspé Bay; and off Cap des Rosiers, have been labelled *R. costata* by the Rev. Canon Norman.

RHAMPHOSTOMELLA PLICATA, Smitt.

"Gulf of St. Lawrence, in company with *R. costata* and *R. bilaminata*" (Hincks). Méti, Dawson, 1877 (Norman).

RHAMPHOSTOMELLA BILAMINATA, Hincks.

Gulf of St. Lawrence (Hincks). Gaspé Bay, Dawson; Orphan Bank, and off Cap des Rosiers, in 38 fathoms, Whiteaves (Norman).

RETEPORA ELONGATA, Smitt.

Dredged by the writer in the Gulf of St. Lawrence, half way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms, small stones and coarse sand, in 1871; and eight miles S.E. of Bonaventure Island, in 56 fathoms, stones and coarse sand, in 1872. It is the *Retepora Wallichiana* of Busk and Hincks.

Family Celleporidae.

CELLEPORA PUMICOSA (L.)

Cellepora verrucosa (L.) O. Fabricius (1780).

Cellepora rumulosa (L.) var., Verrill (1873).

Marsouin, R. Bell, (Sir J. W. Dawson); Gulf of St. Lawrence (Whiteaves); Caribou Island, "frequent on sertularians" (Packard).

Fossil at St. John, N.B. (Matthew).

CELLEPORA AVICULARIS, Hincks.

Le Have Bank, in 45 fathoms, U. S. Fish Commission, 1872 (Smith and Harger).

CELLEPORA CANALICULATA, Busk.

1884. H.M.S. Challenger Reports, Zoology, vol. x., pt. 1, p. 204.

"This species seems to be not uncommon" in the Gulf of St. Lawrence. "It forms small nodular masses, which encrust the stems of Hydroids. It was first obtained on the Challenger voyage in the neighbourhood of Halifax, Nova Scotia, in 51 fathoms" (Hincks, in *Annals and Magazine of Natural History* for February, 1892, p. 156).

CELLEPORA CONTIGUA, Smitt.

Lepralia vitrea, Lorenz (1886).

Gaspé Bay, in a valve of *Mya truncata*, Dawson (Norman).

CYCLOSTOMATA.

Family Crisiidae.

CRISIA EBURNEA (L.)

"Very common in Canso Bay and Bay of Fundy, low-water to 80 fathoms" (Verrill). Off Chebucto Head, Halifax Harbour, in 20 fathoms, soft mud

and fine sand with decaying sea weed, U. S. Fish Commission, 1872 (Smith and Harger). Gulf of St. Lawrence, on *Arca pectunculoides*, in 150 to 200 fathoms, rare; half way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms; and common at other localities in from 10 to 60 fathoms; dredged by the writer in 1871-73. But, in a letter received many years ago, the Rev. Canon Norman says that "the common St. Lawrence form is *C. eburneo-denticulata*, Smitt." Henley Harbour (Strait of Belle Isle) in 4 fathoms; and Hopedale, Labrador, in 10 fathoms, rocky bottom (Packard). Specimens dredged by Dr. G. M. Dawson at the Queen Charlotte Islands, B.C., have been identified with this species by Hincks.

CRISIA EBURNEA, var. CRIBRARIA, Stimpson.

Crisia cribraria, Stimpson (1853).

Crisia eburnea, var. *cribraria*, Verrill (1879).

Grand Manan, taken in 20 fathoms, east of Duck Island (Stimpson).

CRISIA DENTICULATA (Lamarck).

Grand Manan, "on a sponge, taken in 10 fathoms, off Cheney's Head" (Stimpson). This species has also been recognized by Hincks among specimens dredged at the Queen Charlotte Islands by Dr. G. M. Dawson.

Family Tubuliporidae.

STOMATOPORA GRANULATA (Milne Edwards).

Alecto granulata, Milne Edwards.

Proboscina incrassata (Smitt) Verrill (1879).

Specimens that the Rev. Canon Norman has identified with this species were dredged by the writer on the Orphan Bank; and at the entrance to Gaspé Bay, in 50 fathoms, inside dead valves of *Cardium Islandicum*.

STOMATOPORA PENICILLATA (Fabricius).

Tubipora penicillata, O. Fabricius (1780).

Proboscina penicillata (Smitt) Verrill (1879).

Gulf of St. Lawrence, eight miles S. E. of Bonaventure Island, Gaspé Bay, &c., on stones and shells, very common; dredged by the writer and determined by Canon Norman.

STOMATOPORA DIASTOPOROIDES (Norman).

Alecto diastoporoides, Norman (1868).

Stomatopora diastoporoides, Hincks (1880).

With the preceding species, and equally abundant. "Gulf of St. Lawrence, Dawson" (Hincks).

TUBULIPORA LOBULATA, Hassall.

Specimens dredged by Sir J. W. Dawson at Gaspé Bay and Métis, have been identified with *T. lobulata* by Canon Norman.

TUBULIPORA FLABELLARIIS (Fabricius).

Tubipora flabellaris, O. Fabricius (1780).

Tubulipora phalangea, Couch; and Johnston.

"Bay of Fundy, and northward" (Verrill); Marsouin, in 30 fathoms, Bell (Dawson).

TUBULIPORA FIMBRIA, Lamarck.

Tubulipora fimbria, Lamarck.

Tubulipora flabellaris, Johnston (1849).

Dredged by Sir J. W. Dawson, and the writer, in the Gulf of St. Lawrence, at Gaspé Bay and elsewhere, also by Packard off Caribou Island. If the same as *T. palmata*, Wood, and as *T. divisa*, Stimpson (which Verrill regards as a synonym of *T. palmata*) it has been found also at Grand Manan by Stimpson, and on stones in the Strait of Belle Isle, in 50 fathoms, by Packard.

Fossil at Rivière du Loup and Beauport (Sir J. W. Dawson).

TUBULIPORA EXPANSA (Packard).

Stomapora expansa, Packard (1863).

Tubulipora expansa, Verrill (1879).

Near Caribou Island (Packard).

IDMONEA ATLANTICA (Forbes) Johnston.

Idmonea Atlantica (Forbes M. S.) Johnston (1849).

Idmonea pruinosa, Stimpson (fide Verrill).

Grand Manan, "in deep water, especially on shelly bottoms" (Stimpson). Dredged by the writer in 1871 and 1872 at two localities in the Gulf of St. Lawrence, north of the Baie des Chaleurs.

Fossil at Rivière du Loup (Sir J. W. Dawson).

IDMONEA SERPENS (L.)

Tubipora serpens, L. (1767).

Tubulipora serpens, Fleming (1822).

Idmonea serpens, Van Beneden.

Gulf of St. Lawrence, 1872 (Whiteaves); Henley Harbour, Strait of Belle Isle, common,—and "in long twisted masses on *Bugula Murrayana* at Square Island," Labrador, "in 30 fathoms," (Packard).

DIASTOPORA PATINA (Lamarck).

Tubulipora patina, Lamarck, and Johnston.

Long Island Sound to the Arctic Ocean; very common in Casco Bay, Bay of Fundy and northward (Verrill). Grand Manan, "mostly found on sea weeds in shallow water" (Stimpson); Anticosti (Verrill); near Caribou Island; and common at Domino Harbour, Labrador, in 7 fathoms (Packard).

DIASTOPORA OBELIA, Johnston.

Marsouin, attached to dead shells and stones, from a depth of about 30 fathoms, Bell, 1858 (Sir J. W. Dawson). Dredged by the writer in the Gulf of St. Lawrence, half way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms; off Sawhill Point, in 30 fathoms; off Cap des Rosiers, in 38 fathoms; &c.

Fossil in the Leda clay of Rivière du Loup (Sir J. W. Dawson).

Family *Horneridae*.

HORNERA LICHENOIDES (L.).

Millepora lichenoides, L. (1767).

Hornera borealis, Busk (1859).

Hornera lichenoides, Smitt (1866).

Two small examples of this interesting species were dredged by the writer in 1873, in 220 fathoms, about half way between the Island of Anticosti and the Gaspé peninsula.

Family *Lichenoporidae*.

LICHENOPORA HISPIDA (Fleming).

Discopora hispida, Fleming (1822).

Tubulipora hispida, Johnston.

Discoporella hispida, Gray.

Tubulipora crates, Stimpson (1853).

Grand Manan, "found encrusting *Terebratulæ* in deep water" (Stimpson). Dredged by the writer on the Orphan Bank, in 1873; off Cap des Rosiers, in 38 fathoms, and half way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms, in 1871. Near Caribou Island, "frequent on sertularians in 50 fathoms" (Packard).

Fossil at Rivière du Loup (Sir J. W. Dawson).

LICHENOPORA VERRUCARIA (Fabricius).

Madrepora verrucaria, O. Fabricius (1780).

Lichenopora verrucaria, Smitt (1878).

Bay of Fundy; and near Caribou Island, in 50 fathoms (Packard). Marsouin, Bell (Sir J. W. Dawson). Off Bonaventure Island, in 60 fathoms; entrance to Gaspé Bay, in 50 fathoms; and off Cap des Rosiers, in 38 fathoms; Whiteaves (Norman).

LICHENOPORA REGULARIS (Orbigny).

Actinopora regularis, Orbigny (1851).

Lichenopora regularis, Hincks (1880).

Gulf of St. Lawrence, one fine specimen, attached to the zoarium of a colony of *Porella* (*Celleporaria*) *sircularis*, Packard. The specimen, which was dredged by the writer, has been identified with this species by the Rev. Canon Norman, who writes as follows in regard to it. "Only two other recent specimens are known, both taken by me in Shetland, one of which is in Mr. Alder's collection, the other (figured by Hincks) in my own."

LICHENOPORA CLYPEIFORMIS (Orbigny).

Discoporella clypeiformis, Smitt (1871).

Three specimens, which the Rev. Canon Norman identified with this species in 1876, were dredged by the writer to the north-east, and north-east by east, of Cape George, N.S., in 1873. In reference to them Canon Norman wrote as follows: "*Discoporella clypeiformis*, Orb.—I have not that author's work here to refer to, but consider this the species thus named by Smitt in Floridan Bryozoa, Pt. 1, p. 12, Pl. 4, fig. 3."

FASCIPORINA FLEXUOSA (Orbigny).

Bradelle Bank, and Gaspé Bay, a few specimens, that were dredged by the writer and determined by the Rev. Canon Norman.

DISCOFASCIGERA LUCERNARIA (Sars).

Defrancia lucernaria, M. Sars (1862).

Discofascigera lucernaria, Verrill (1873).

Atlantic coast of Nova Scotia, one specimen (Sir J. W. Dawson). Gulf of St. Lawrence, one fine specimen dredged by the writer on the north shore, between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms, in 1871; and one imperfect but characteristic specimen dredged off Bonaventure Island, in 50 fathoms, in 1872.

CTENOSOMATA.

Family *Alcyonidiidae*.

ALCYONIDIUM GELATINOSUM (L.)

Alcyonium gelatinosum, L. (1767); and O. Fabricius (1780).

Alcyonidium gelatinosum, Johnston (1849).

Gulf of St. Lawrence, dredged by the writer on the Orphan Bank, and between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms.

Verrill says that *A. hirsutum* (Fleming) and *A. parasiticum* (Fleming) extend, the one from Long Island Sound, the other from Rhode Island,—to the Arctic Ocean; so that both are to be looked for in the Gulf of St. Lawrence.

FLUSTRELLA HISPIDA (Fabricius).

Flustra hispida, O. Fabricius (1780).

Flustrella hispida, Gray (1848).

Alcyonidium hispidum, Johnston (1849).

"Long Island Sound to Greenland," . . . "Bay of Fundy, &c." (Verrill). Encrusting stems of *Fucus nodosus* on the south side of Cape Blomidon, N. S., (Prof. G. T. Kennedy, 1875).

HOLOBRANCHIA.

Family *Pedicellinidae*.

PEDICELLINA NUTANS, Dalyell.

"The form which I have identified with Dalyell's species occurs plentifully and of large size in the St. Lawrence" (Hincks, 1889; Ann. and Mag. Nat. Hist., Ser. VI., vol. III., p. 432).

BARENTSIA MAJOR, Hincks.

1888. Ann. and Mag. Nat. Hist. Ser. VI., vol. I., p. 226.

"The Pedicellinidae abound in the northern seas. The St. Lawrence dredgings have already yielded *P. nutans*, Pallas,* *Barentsia major*," and *B. gracilis*, Sars" (Hicks, under the heading *P. nutans*; op. cit. vol. III., p. 432).

BARENTSIA GRACILIS, M. Sars.

Gulf of St. Lawrence (Hincks).

* Probably written inadvertently for Dalyell.

MOLLUSCA.

PELECYPODA.

Family *Anomiadae*.

ANOMIA ACULEATA, Müller.

Anomia aculeata, Müller (1766) ; Gmelin (1792) ; et auct.

Widely distributed in and to the north and south of the Gulf of St. Lawrence, at depths of less than 100 fathoms. The little smooth *Anomia* of this region that has been hitherto referred to *A. ephippium*, is regarded by Verrill as most probably a form of *A. aculeata* in which the aculeate scales are more or less abortive.

ANOMIA SIMPLEX, Orbigny.

Anomia simplex, Orbigny (1845, Spanish edition ; 1853) ; teste Dall.

Anomia electrica, Gould (1841 and 1870) ; non L. (Dall).

Anomia squamula, Gould (1841 and 1870) ; non L. (Dall).

Anomia glabra, Verrill (1872 and 1875).

Southern coast of Nova Scotia, off Cape Sable, 8 fathoms, but not observed in the Bay of Fundy (Verrill).

Family *Ostreidae*.

OSTREA VIRGINICA, Gmelin.

Ostrea Virginiana, of Lister and other nonbinomial writers (Dall).

Ostrea Virginica, Gmelin (1792) ; Dillwyn (1817) ; and Lamarck (1819).

Ostrea borealis, Lamarck (1819).

Ostrea Canadensis, Lamarck (1819).

"In the Gulf of St. Lawrence, oysters are usually found in very shallow water, nearly always in depths of less than three fathoms, in sheltered bays or mouths of rivers. In New Brunswick, as has been shown by Perley, they range from Caraquette to Baie Verte. The writer was informed by Captain Purdy that oysters have been taken up on the flukes of anchors, in 7 fathoms water between Little and Big Caraquette banks, in the Baie des Chaleurs. On the coast of Prince Edward Island, oysters are found, in suitable localities, from Pinette River to the west point, on the Northumberland Strait side ; and in Malpeque or Richmond Bay, from Cascumpeque to New London, on the northern. In Cape Breton they appear to be confined to Bras d'Or Lake and its tributaries, where the oyster region extends from St. Ann's to Mira River and St. Peter's Bay. The few oysters to be met with off Nova Scotia occur at Jeddore Head, twenty or twenty-five miles east of Halifax Harbour, also Country Harbour, St. Mary's River, and Lipscombe Harbour, Guysboro' Co., on the outside ; and Pictou Harbour,

River John, Wallace, Charles River, and Pugwash, in Northumberland Strait. We did not find traces even of oysters between Cape Breton and Prince Edward Island, nor in any other part of Northumberland Strait where the bottom is deeper than five or six fathoms, that is to say, not in any of the open parts" (Whiteaves).*

The exterior of the shell of the shorter and more rounded variety of the Canadian oyster is not unlike that of some forms of the English species, but the muscular impression in the interior of each valve is always dark in the former, and white in the latter. Dall, also, has recently shown that the English oyster is a typical *Ostrea*, which is monœcious and produces "large embryos which are incubated for a considerable period in the parental gill lamina," and that the common oyster of Canada and the north-eastern United States belongs to a "group characterized by being dioecious and discharging the seminal products directly into the water, which must take the name *Crassostrea*, Sacco. "This is typified by *Ostrea Virginiana*, Gmel., and represented in the present European fauna by *Ostrea angulata*, Lam., known there as the Portuguese oyster."†

Family *Pectinidae*.

PECTEN (CHLAMYS) ISLANDICUS, Müller.

Ostrea Islandica, Müller (1776); and O. Fabricius (1780).

Pecten Islandicus, Chemnitz (1784); Lamarck, et auct.

Pecten Peuleii, Conrad (1831).

Chlamys Islandica, Fischer (1886); and Verrill (1897).

A common species in the north Atlantic, the type of Bolten's genus or subgenus *Chlamys*. On the American side it is known to range from Cape Cod to Hudson Bay and Strait, and Greenland, from low-water mark to 100 fathoms in depth. Off the Nova Scotian coast it is said by Willis to be common at Halifax Harbour, St. Margaret's Bay, and Sable Island; on the Bay of Fundy side Verkrusen found it at Annapolis Basin. From New Brunswick it is recorded as having been taken at Grand Manan by Stimpson; in the Bay of Fundy by the U. S. Fish Commission, in 1872, and in L'Etang Harbour in 1886. In the Gulf and mouth of the River St. Lawrence it has been dredged at many localities, by Packard, Bell, Sir J. W. Dawson, and the writer.

As a Canadian Pleistocene fossil it is recorded by Sir J. W. Dawson as having been collected at St. John, N.B.; Anticosti and Rivière du Loup, P.Q., also at Labrador; and in 1896 Mr. A. P. Low obtained good specimens of it from the Pleistocene clay at Richmond Gulf, on the east coast of Hudson Bay.

* Report of the Department of Marine and Fisheries for 1873, Ottawa, 1874.

† Transactions of the Wagner Free Institute of Science of Philadelphia, vol. III., p. 671.

PECTEN GIBBUS, var. BOREALIS, Say.

Pecten borealis, Say (1822); teste Dall.

Pecten concentricus, Gould (1841); as of Say.

Pecten irradians, (Lamarck) Stimpson (1851); Gould (1870); et auct.

Chlamys (*Æquipecten*) *irradians*, Verrill (1897).

Pecten (*Plagioctenium*) *gibbus*, var. *borealis*, Dall (1898).

Specimens of this well known New England species were collected at Sable Island, off the coast of Nova Scotia, many years ago by Willis, and more recently (in 1899) by Professor Macoun.

"This is the large, thin, dark-coloured form of the New England coast, ordinarily known as *irradians* Lamarck. It usually has fewer ribs than the typical *irradians*, a thinner shell, and more conspicuous concentric lamellæ. It is also rather more compressed. Of seventeen specimens two had sixteen, eleven seventeen, and the remainder eighteen ribs. It may be variegated with orange, gray, dark brown, or olive and white, but, on the whole, constantly averages darker than the southern specimens. It lives in the open bays on weedy or pebbly bottom"* (Dall). Of the typical *P. irradians* (= *concentricus*), which he regards also as a variety of *P. gibbus*, Dall writes; "This is the southern and typical form of which *borealis* is the northern geographical race. It extends from New Jersey, which is Say's typical locality, south to Georgia and Texas.†

PECTEN (PLACOPECTEN) MAGELLANICUS (Gmelin).

Ostrea Magellanica, Gmelin (1792); and Dillwyn (1817).

Ostrea grandis, Solander (1786); fide Humphrey (Dall).

Pecten grandis, Humphrey (1797); fide Dall.

Pecten Magellanicus, Lamarck (1819); ed. Desh., (1834); Gould (1841 and 1870); et auct.

Pecten tenuicostatus, Mighels and Adams (1841 and 1842); et auct. Am.

Chlamys (*Placopecten*) *Clintonius*, Verrill, ex parte (1897); Dall.

Pecten (*Placopecten*) *magellanicus*, Dall (1898).

The large edible scallop of the Maritime Provinces and the Gulf of St. Lawrence, which is said to be especially abundant in Passamaquoddy Bay, and the Bay of Fundy. The most northerly locality at which it has been recorded is on the north shore of the Gulf, just inside of the Strait of Belle Isle, off Caribou Island, P.Q., where Packard says that it is most abundant on a sandy bottom at a fathom depth, the young only being dredged in 15 fathoms. In Northumberland Strait, and in Gaspé Bay, it seems also to be most abundant in shallow water near the shore, whereas throughout the Gulf *P. Islandicus* is more common in a little deeper water and on banks at some distance from land.

* Transactions of the Wagner Free Institute, of Science of Philadelphia, vol. III., pp. 747-748.

† Idem, p. 748.

Although known to naturalists for more than a century, there is still some difference of opinion as to which of the specific names that have been proposed for this shell should be retained. *Magellanicus* is clearly the oldest, but it has been objected to by some naturalists on the ground that it contravenes that rule of the British Association which says that no specific name should be retained that tends to perpetuate error. Verrill (in a recent Study of the Family Pectinidæ, published in 1897*) says that *P. Magellanicus* is a "bad and misleading name, if applied to this species," which he identifies with the Miocene *P. Clintonius* described by Say in 1824, and calls *Chlamys (Placopecten) Clintonius*. Dall, on the other hand, in 1898, has expressed the opinion that the recent shell is distinct from *P. Clintonius*, and "sees no reason why Gmelin's name (*Magellanicus*) "given in error as to the true habitat of this species, but universally familiar, should not continue to be used. If, however," he adds, "an exaggerated purism demands a change, the next most appropriate name is that of Solander (*Ostrea grandis*) given without description in the Portland Catalogue, described in the Bankian M.S.S., and cited by Humphrey as *Pecten grandis*, 'the Great Compass shell from Newfoundland, with nearly equal valves,' remarks which cannot possibly apply to any other species."†

Sir J. W. Dawson states that Dr. G. F. Matthew has found specimens of *P. Magellanicus* in the Leda clay of St. John, N.B.

PECTEN (CAMPTONECTES) GRÆNLANDICUS, Sowerby.

Pecten Grænladicus, Sowerby (1843); and G. O. Sars (1878).
Camptonectes Grænladica, Verrill (1897).

Dredged by the writer in 1871, 1872 and 1873, in considerable numbers living, but of rather small size, in the deep-sea mud, at depths of from 200 to 313 fathoms, in the Gulf of St. Lawrence, to the north, south-east and south of the Island of Anticosti. As many as fifty or sixty living specimens were picked at a time from one weighted hempen tangle, or "swab," as the sailors would call it, that was used as well as the dredge. It was quite common to find individuals each clasping a single fibre of the swab between its valves transversely, at about the mid-length of the animal, and so tightly that one had to cut the fibre on each side of the shell, in order to save the specimen.

In the summer of 1899, a few similar but much larger specimens of this shell were dredged by Mr. A. P. Low, in from 15 to 25 fathoms, mud, in Richmond Gulf, Hudson Bay.

According to Sir J. W. Dawson, *P. Grænladicus* has been found fossil in the Pleistocene deposits of Maine, but not in those of Canada.

* Transactions of the Connecticut Academy of Arts and Sciences, vol. x., p. 78.

† Transactions of the Wagner Free Institute of Science of Philadelphia, vol. III., pp. 726 and 727.

PECTEN (CAMPTONECTES) VITREUS (Chemnitz).

? *Pecten vitreus*, Gmelin (1792); and Dillwyn (1817); Dall.

Pecten vitreus (Chemnitz) G. O. Sars (1878).

Camptonectes (Palliolum) vitreum, Verrill (1897).

Camptonectes vitreus, Dall (1898).

"Common on the deep-water fishing grounds off Nova Scotia and Newfoundland, in 57 to 400 fathoms" (Verrill).

PECTEN (CYCLOPECTEN) PUSTULOSUS, Verrill.

Pecten pustulosus, Verrill (1873).

Pecten Hoskynsi, Verrill (1882); but not of G. O. Sars.

Pecten imbrifer, Dall (in part) 1886; but not of Loven.

Cyclopecten pustulosus, Verrill (1897).

"The original specimens" of *P. pustulosus* were "from south of George's Bank, 430 fathoms, and Gulf of Maine, 150 fathoms," where they were dredged by the U. S. Fish Commission in 1872. "It was afterwards dredged by us, in 1877, in the Gulf of Maine, 115 fathoms, and off Nova Scotia, in 190 fathoms, associated with the non-pustulose form" (Verrill).

Family Limidae.

LIMATULA SUBAURICULATA (Montagu).

Pecten subauriculata, Montagu (1808).

Ostrea subauriculata, Turton (1816).

Lima subauriculata, Turton (1822).

Lima sulcata, Brown (1827); and Möller (1842).

Limatula subauriculata, Searles Wood (1839).

North shore of the Gaspé peninsula at St. Anna des Monts (Bell, 1858). Off Cap des Rosiers in 38 fathoms, stones, one living adult specimen; and about half way between East Cape, Anticosti, and the Bird Rocks, in 313 fathoms mud, a fragment of one of the valves; both dredged by the writer, the former in 1871 and the latter in 1872.

Limatula sulculus, the *Lima sulculus* (Leach) Möller, is stated by Willis to be very rare at Sambro and Sable Island, N.S.; and Packard says that he dredged several specimens of it near Caribou Island, in 15 to 50 fathoms. But, it is not quite clear that the Canadian shells which have been referred to *L. sulculus* are really distinct from those that have been identified with *L. subauriculata*. Jeffreys unites *L. sulculus* with *L. subauriculata*.

Family *Mytilidæ*.

MYTILUS EDULIS, L.

Common everywhere, at or a little above low-water mark. As a Canadian Pleistocene fossil it has been found in Lawlor's Lake, near St. John, N.B.; at Anticosti, Rivière du Loup, Quebec and Montreal, P.Q.; at Ottawa; and on the coast of Labrador.

MODIOLA MODIOLUS (L.).

Not nearly so common as the preceding species, and found in a little deeper water. Like *M. edulis* it is circumpolar and widely distributed on both sides of the North Atlantic and North Pacific.

In a fossil state, *M. modiolus* is recorded by Sir J. W. Dawson as being very rare in the Pleistocene deposits of Montreal.

MODIOLA (BRACHYDONTES) DEMISSA (Dillwyn).

Mytilus demissus (Solander) Dillwyn (1817); teste Dall.

Modiola plicatula, Lamarck (1835); et auct. Amer.

'Minas Basin (G. T. Kennedy, 1875); Wallace, Tracadie, Sable Island, Pictou, &c., not scarce (Willis). Prince Edward Island (Sir J. W. Dawson, 1871); Charlottetown Harbour (F. Bain, 1875); Shediac (L. M. Lambe, 1893); and mouth of the Douglastown River, Gaspé Bay (Bell, 1858).

DACRYDIUM VITREUM (Möller).

Modiola? vitrea, Möller (1842).

Dacrydium vitreum, Torell (1859); et auct.

Specimens of this species were dredged in the deepest parts of the Gulf of St. Lawrence, in from 100 to 313 fathoms, by the writer in 1871, 1872 and 1873; also subsequently, in 1877, according to Verrill, off Nova Scotia, in 102 fathoms, by the U. S. Fish Commission

MODIOLARIA DISCORS (L.)

Mytilus discors, L. (1767); and Stimpson (1851).

Mytilus discrepans, Montagu (1803).

Modiola lavigata, Gray (1824).

Modiola discrepans, Lamarck (1835).

Modiolaria discors, Løven (1846) et auct.

Common on both sides of the north Atlantic, from low-water to 100 fathoms, in "nests formed of various marine substances," as Dr. Stimpson observes. In the Bay of Fundy it has been collected by Stimpson and the U. S. Fish Commission; in Annapolis Basin by Verkrusen; on the Atlantic

coast of Nova Scotia by Willis and J. Matthew Jones ; at several localities in the Gulf and mouth of the River St. Lawrence, by Sir J. W. Dawson, Bell, Packard and the writer ; also at Port Burwell and Ashe Inlet, Hudson Strait, by Bell (in 1884). The species has also been found fossil, in the Pleistocene deposits of Beauport, Montreal and Greenland.

MODIOLARIA CORRUGATA (Stimpson).

Mytilus corrugatus, Stimpson (1851).

Modiolaria corrugata, Mörch (1857) ; and Gould (1870).

The geographical distribution and bathymetrical range of this species in eastern Canada are essentially the same as those of *M. discors*.

M. corrugata has been found fossil in the Pleistocene deposits of Rivière du Loup (en bas), by Sir J. W. Dawson.

MODIOLARIA NIGRA (Gray).

Modiola nigra, Gray (1824).

Modiola nexa, Gould (1841). Young.

Modiolaria nigra, Loven (1846).

Mytilus discrepans, Stimpson (1851) ; not of European authors.

Modiolaria discrepans, Packard (1867).

Has been taken in the Bay of Fundy, in Annapolis Basin ; in Halifax Harbour, N.S. ; at several localities in the Gulf and mouth of the River St. Lawrence ; on the Atlantic coast of Labrador, and more recently, at Port Burwell, and Ashe Inlet, Hudson Strait.

It has been collected also in the Pleistocene deposits at Kennebeck, Maine ; at Black Point, N.B. ; at Rivière du Loup, Montreal ; and Labrador.

CRENELLA FABA (Müller).

Mytilus faba, Müller (1776) ; and O. Fabricius (1780).

Crenella faba, Stimpson (1860).

Henley Harbour, Strait of Belle Isle, in 4 fathoms (Packard). L'Anse au Loup, 10 to 15 fathoms ; Fox Harbour, St. Lewis Island, 1 to 4 fathoms ; and Dead Island, near Square Island, in shallow water ; Stearns expedition (Miss Bush). Common on the Labrador reef, near Fort Chimo, Ungava Bay, L. M. Turner, 1885 (Dall). Greenland (Fabricius).

CRENELLA PECTINULA (Gould).

Modiola pectinula, Gould (1841).

Mytilus pectinulus, Stimpson (1851).

Crenella pectinula, Stimpson (1860).

Gulf of St. Lawrence, Mighels (Gould). Gaspé Bay and off Cap des Rosiers lighthouse, dredged by the writer ; Ruisseau Vallée and Marsouin

(Bell); Mingan Islands (J. Richardson); Murray Bay, abundant (Sir J. W. Dawson). Professor Verrill regards *C. pectinula* as synonymous with *C. faba*, but this opinion is not shared by Dr. Dall, who, in a letter to the writer, dated February 18, 1901, writes as follows. "*Crenella pectinula*, of which I have one of Gould's types, I regard as perfectly distinct from *C. faba*. "*C. pectinula* is light yellow brown, with coarser sculpture and more rotund form than the purple *C. faba*. But *C. pectinula* appears to be very rare and I have seen only the types, while *C. faba* is common in the Arctic."

CRENELLA GLANDULA (Totten).

Modiola glandula, Totten (1834).

Mytilus decussatus, Stimpson (1851); non Montagu.

Crenella glandula, H. and A. Adams (1858); and Gould (1870).

Bay of Fundy (Stimpson,—and Verrill); Passamaquoddy Bay, N. B. (Ganong); Annapolis Basin (Verkrutzen); Gulf and mouth of the River St. Lawrence at many localities, (collected by Bell, Sir. J. W. Dawson, Packard, and the writer); and Atlantic coast of Labrador, off Square Island, low-water to 60 fathoms (Packard).

CRENELLA DECUSATA (Montagu).

Mytilus decussatus, Montagu (1808).

Modiola? cicercula, Möller (1842).

Crenella decussata, Loven (1846); et auct.

Bay of Fundy, common (Verrill); Annapolis Basin (Verkrutzen); off Grande Grève, Gaspé Bay, and other localities in the Gulf of St. Lawrence, in from 20 to 60 fathoms, dredged by the writer; Greenland (Möller).

Family Nuculidae.

NUCULA TENUIS (Montagu).

a. Forma TYPICA.

Arca tenuis, Montagu (1808).

Nucula tenuis, Turton (1822); et auct.

Nucula tenuis, forma *typica*, G. O. Sars (1878).

b. Forma INFLATA.

Nucula tenuis, Möller (1842).

Nucula inflata, Hancock (1846).

Nucula obliquata, Beck (1847); teste Mörch.

Nucula tenuis, forma *inflata*, G. O. Sars (1878).

Both varieties of this shell are widely distributed on the European as well as on the American side of the north Atlantic, in from 4 to 100

fathoms. On the east coast of North America the species is known to range from Cape Cod and the Maritime Provinces to the Gulf of St. Lawrence and Arctic Ocean, and the typical form occurs also in the waters of British Columbia. The var. *inflata*, with its subtrapeziform contour, that is "angular in all its outlines" and well represented by "Fig. 460" on page 153 of the second edition of Gould's Invertebrata of Massachusetts, is common in the Gulf of St. Lawrence and on the Labrador coast. It is this variety, and not the *N. expansa* of Reeve, as since figured in the second edition of Gould, that was referred to, under the latter name, by the writer, in a paper "on the Marine Mollusca of Eastern Canada" published in the "Canadian Naturalist" for 1869.

N. tenuis is recorded by Sir J. W. Dawson as having been found fossil in the Pleistocene deposits of Saco, Maine; of the Baie des Chaleurs, Riviere du Loup, Montreal, and Greens Creek, near Ottawa.

NUCULA EXPANSA, Reeve.

Nucula expansa, Reeve (1855).

Nucula Bellotii, Adams (1856).

North shore of the Gulf of St. Lawrence between the Mecatina Islands and Bradore Bay, on a muddy bottom, with *N. tenuis*, 1860; and Chateau Bay, Labrador, of large size, 1864 (Packard), who says that Dr. Stimpson "has identified our specimens as being this before doubtful species." Little Métis and Murray Bay (Sir J. W. Dawson). Ashe Inlet and Port Burwell, Cape Chudleigh, Hudson Strait (Bell, 1884); off Churchill, Keewatin, in 30 fathoms (Commander Wakeham, Diana Exploring expedition, 1897).

As a fossil *N. expansa* is recorded as having been collected in the Leda clay at Westbrooke, Duck Cove, St. John, N.B.; and at Rivière du Loup, P.Q.

G. O. Sars, however, thinks that *N. expansa* is identical with *N. tenuis* var. *inflata*, and Sir J. W. Dawson that the former is probably a "large and well developed northern form of *N. tenuis*."

NUCULA PROXIMA, Say, var TRUNCULUS, Dall.

1898. Trans. Wagner Fr. Inst. Sc. Philad., vol. III., p. 574.

Grand Manan, "in 4 fathoms sand off Duck Island Weir" (Stimpson); Bay of Fundy, 4 to 80 fathoms, common (Verrill); Annapolis Basin, abundant (Verkruzen); fishing banks off Halifax, rare (Willis).

"If a geographical series of this species be examined, it will be noticed that the northern specimens are almost smoothly truncate behind, the escutcheon is not impressed to any marked degree, and there is no angle at the margin below the escutcheon. On the other hand, the specimens from

the southern coast, whence Say's type was derived, have a thinner shell with an impressed escutcheon, the middle of which pouts more or less strongly; the valve margin below the escutcheon has a projecting angle; the shell is somewhat compressed, compared with the northern form, and has a paler and more delicate epidermis. Several of these characters are correlatives of the latitude, but the extreme forms without a connecting series would be taken by any careful observer for distinct species. Most of the conchologists of the United States having resided north of Delaware, the northern form is the more familiar both in books and collections, but it is not the original type, and I have therefore given it a varietal name" (Dall, op. cit. supra.)

NUCULA DELPHINODONTA, Mighels.

Nucula delphinodonta, Mighels (1842).

Nucula corticata, (Holböll) Möller (1842); fide Mörch.

Grand Manan, 25 fathoms mud on the Hake ground (Stimpson); "Bay of Fundy, and Eastport Harbour, 10 to 100 fathoms, mud, common" (Verrill); Annapolis Basin, N.S., rather abundant (Verkrusen); fishing banks off Halifax (Willis). Northumberland Strait, and off Grande Grève, Gaspé Bay, in 50 fathoms, mud, dredged by the writer.

Family *Ledidae*.

LEDA MINUTA (Müller).

Arca minuta, Müller (1776); and O. Fabricius (1780).

Leda minuta, Möller (1842); et auct.

Fishing banks off Halifax, rare (Willis). Off Grande Grève, Gaspé Bay, in 50 fathoms, mud (1869) and off Cap des Rosiers village (1869) dredged by the writer; Little Métis and Kamouraska (Sir J. W. Dawson). Labrador coast, at Long Island, 15 fathoms; Henley Harbour, 20 fathoms; Chateau Bay, 50 fathoms; and Square Island, 30 fathoms (Packard). Greenland (Fabricius).

Also, fossil in the Leda clay at St. John, N.B.; Rivière du Loup and Montreal.

LEDA PERNULA (Müller⁵).

Arca pernula, Müller (1779); fide Loven.

Arca rostrata, Gmelin (1792); fide Loven.

Leda pernula, Loven⁶ (1846); et auct.

Off Halifax, N.S., in 59 fathoms; a typical example, dredged in 1887 (Verrill). Off Grande Grève, Gaspé Bay, in 50 fathoms, mud, dredged by the writer; Little Métis and Kamouraska (Sir J. W. Dawson). Port Burwell and Ashe Inlet, Hudson Strait (Bell).

Fossil in the Leda clay of Portland and Saco, Maine ; of Lawlor's Lake, near St. John, N.B. ; and of New Richmond, and Rivière du Loup, P.Q.

LEDA PERNULA, var. JACKSONII.

Nucula Jacksonii, Gould (1841).

Leda buccata (Steenstrup) Möller (1842) ; fide Stimpson.

Leda Jacksonii, Gould (1870).

North shore of the Gulf of St. Lawrence, off Caribou Island, just inside of the Strait of Belle Isle, abundant ; Labrador coast, at Long Island and Henley Harbour, in 15 to 20 fathoms, (Packard) ; Henley Harbour and Temple Bay in 10 to 15 fathoms, Stearns expedition (Miss Bush). A shorter and more tumid shell than the typical *L. pernula*, with the cardinal margin eroded in such a manner as to "show the origin of the hinge denticles."

LEDA TENUISULCATA (Couthouy).

Nucula tenuisulcata, Couthouy (1838).

Nucula minuta, Gould (1841).

Leda tenuisulcata, Hanley (1860) ; Gould (1870) ; et auct.

Grand Manan, "common on muddy bottoms" (Stimpson) ; Bay of Fundy, common in 6 to 80 fathoms (Verrill) ; Passamaquoddy Bay (Ganong) ; fishing banks off Halifax, rare (Willis). Gulf of St. Lawrence, off Cap des Rosiers, in 110 fathoms coarse sand, with stones, dredged by the writer. Perhaps a slender, compressed variety of *L. pernula*, with the beaks placed rather near to the anterior end.

YOLDIA LIMATULA (Say).

Nucula limatula, Say (1831).

Leda limatula, Stimpson (1851).

Yoldia limatula, H. & A. Adams (1858).

Grand Manan in 6 fathoms mud (Stimpson) ; Bay of Fundy, 4 to 30 fathoms (Verrill) ; fishing banks off Halifax, rare (Willis). Very common throughout Northumberland Strait, but rare in the northern part of the Gulf of St. Lawrence (Whiteaves) ; Little Métis (Sir J. W. Dawson). Fossil in the Leda clay at Rivière du Loup (Sir J. W. Dawson).

YOLDIA SAPOTILLA (Gould).

Nucula sapotilla, Gould (1841).

Leda (*Yoldia*) *sapotilla*, Stimpson (1851).*

Yoldia sapotilla, H. & A. Adams (1858) ; Packard (1861) ; and Gould (1870).

Grand Manan, "10 fathoms, Welch Pool" (Stimpson) ; common in Casco Bay and the Bay of Fundy, 4 to 100 fathoms, mud (Verrill) ; fishing banks

off Halifax (Willis); Halifax Harbour (J. M. Jones). Occasionally met with in Northumberland Strait, by the writer in 1873, associated with *Y. limatula*, of which it may be a small "abbreviated" variety; Little Métis (Sir J. W. Dawson); off Caribou Island, at a depth of 10 to 15 fathoms (Packard).

Fossil at Black Point, N.B. (G. F. Matthew).

YOLDIA MYALIS (Couthouy).

Nucula myalis, Couthouy (1838).

Leda myalis, Stimpson (1851).

Yoldia myalis, Gould (1870).

Grand Manan, 20 fathoms, mud (Stimpson); Bay of Fundy and Annapolis Basin (Verkruzen); fishing banks off Halifax, rare (Willis); Gulf of St. Lawrence (Mighels). Gulf and mouth of the River St. Lawrence, at Gaspé Bay and the coast of the Gaspé peninsula, Sir J. W. Dawson (as *Leda limatula*), Bell, and the writer; Little Métis, Kamouraska, and Murray Bay (Sir J. W. Dawson). North shore of the Strait of Belle Isle, at L'Anse au Loup, in 15 fathoms, sand, a very badly worn valve, Stearns expedition (Miss Bush). Port Burwell and Ashe Inlet, Hudson Strait (Bell). A more northerly species than *Y. limatula*, as pointed out by Professor Verrill.

A single valve of *Y. myalis* was found in the Leda clay at Hopedale, Labrador, by Dr. Packard in 1864.

YOLDIELLA LUCIDA (Loven).

Yoldia lucida, Loven (1846); et auct.

? *Leda obesa*, Stimpson (1851).

Yoldia obesa, Gould (1870); et auct.

Yoldiella lucida, Verrill and Bush (1897).

Yoldia (*Yoldiella*) *lucida*, Dall (1898).

A few living specimens of this species were dredged by the writer in 1871, 1872 and 1873, in the deepest parts of the Gulf of St. Lawrence to the north, south and south-east of the Island of Anticosti, in 100 to 313 fathoms, mud, associated with *Pecten Grænlædicus*, *Dacrydium vitreum*, *Arca pectunculoides*, a dwarf form of *Astarte crebricostata*, &c. Verrill says that it is "rare in the Bay of Fundy, in 40 to 100 fathoms."

YOLDIELLA FRIGIDA (Torell).

Yoldia frigida, Torell (1859); G. O. Sars (1878); et auct.

Yoldiella frigida, Verrill and Bush (1898).

Living specimens of this shell were dredged sparingly by the writer, in 1871, 1872 and 1873, with the preceding species, in the deepest parts of the Gulf of St. Lawrence.

(PORTLANDIA GLACIALIS (Wood)).

No recent specimens of this shell, which is such a characteristic fossil of the Leda clay in eastern Canada, have yet been found south of the Strait of Belle Isle, on this side of the Atlantic. In 1899, however, Mr. Low dredged four fine living specimens of it in Richmond Gulf, on the east coast of Hudson Strait, on a muddy bottom, in 15-25 fathoms.

G. O. Sars, and more recently Verrill (in 1897) think that this shell is the *Nucula arctica* of Gray (1819), and that it should be called *Portlandia arctica* (Gray), as it is the type of Mörch's genus *Portlandia*. Dall, however, in 1898, dissents from this conclusion, as far as the specific name is concerned, and maintains that the proper name for it is *Portlandia glacialis* (Wood) for the following reasons. "The original *Nucula arctica*, Gray, is indeterminable from the brief diagnosis, and was not figured. It has been identified by several naturalists (Hanley, Smith and others) with *Y. hyperborea*, Torell, and by others with *Y. glacialis*, Wood (+ *Y. truncata*, Brown, + *Y. portlandica*, Hitchcock). From Möller's description of his *Y. arctica* as 'planiuscula lævi, nitida, luteo-vel fusco virente,' and the number of teeth he ascribes to it, I feel compelled to believe that it could not have been *Y. glacialis*, whatever Gray's *N. arctica* was."* And in a foot note to this last sentence he adds: "In this also I agree with Hanley and Smith in referring Gray's species to the *hyperborea* group rather than to that of *truncata*, Brown, as supposed by Torell, Jeffreys and Mörch)."

MEGAYOLDIA THRACIÆFORMIS (Storer).

Nucula thraciæformis, Storer (1838); and Gould (1841).

Nucula navicularis, Couthouy (1830); young.

Yoldia angularis, Müller (1842); teste Mörch.

Megayoldia thraciæformis, Verrill and Bush (1897).

Grand Manan, "in 25 fathoms, mud, off Duck Island" (Stimpson); Bay of Fundy, 10 to 100 fathoms (Verrill); fishing banks off Halifax (Willis); Halifax Harbour (J. M. Jones). Off the north-west coast of Cape Breton Island (dead specimens), and Gulf of St. Lawrence, about half way between Anticosti and the Gaspé peninsula, in 200 fathoms, mud, rare and small, but living, dredged by the writer. Greenland (Möller—*Yoldia angularis*).

* Transactions of the Wagner Free Institute of Science of Philadelphia, vol. III., pp. 594 and 595.

Family *Arcidae*.

ARCA (BATHYARCA) PECTUNCULOIDES, Scacchi.

Arca pectunculoides, Scacchi (1834); fide Nyst.

Arca raridentata, Searles Wood (1840).

Bathyarca pectunculoides, Verrill and Bush (1898).

Living in deep water (200 to 313 fathoms) in the Gulf of St. Lawrence, to the north, south and south-east of the Island of Anticosti, where specimens of it were dredged by the writer in 1871, 1872 and 1873.

According to Verrill this species has been taken by dredging parties of the U. S. Fish Commission, since 1872, in the Bay of Fundy, 108 fathoms; on Georges and Le Have Banks, and off Halifax, Nova Scotia, at various depths, from 70 to 430 fathoms.

ARCA (BATHYARCA) GLACIALIS, Gray.

Arca glacialis, Gray (1824); et auct.

Bathyarca glacialis, Verrill and Bush (1898).

"This species has been recorded from the Gulf of St. Lawrence by Jeffreys" (Verrill).

Family *Cardiidae*.

CARDIUM (CERASTODERMA) CILIATUM, Fabricius.

Cardium ciliatum, O. Fabricius (1780).

Cardium Islandicum, Chemnitz (1782); Spengler (1808); et auct.

Cardium (Cerastoderma) ciliatum, Dall (1900).

Common, at moderate depths, throughout the whole of the region under consideration. It is the large fringed-ribbed cockle of the Gulf of St. Lawrence, and both it and *Serripes Greenlandicus* form an important part of the food of the halibut and cod. Both, also, are known to inhabit the coast of Labrador, Hudson Bay and Greenland, and to extend their range southward to Cap Cod.

In a fossil state *C. ciliatum* has been found in the Pleistocene deposits of Portland, Me.; of Lawlor's Lake, near St. John, N.B.; of Little Métis, Rivière du Loup, the Saguenay and Murray Bay, P.Q.; also of two or three miles up Whale River, Hudson Bay (Bell, 1877); of near Moose Factory, James Bay (Bell, 1875, and A. S. Cochrane, 1877); of the Limestone rapids of the Fawn Branch of the Severn River, Keewatin (A. P. Low, 1886); and of Vancouver Island, B.C.

CARDIUM (CERASTODERMA) PINNULATUM, Conrad.*Cardium pinnulatum*, Conrad (1831); et auct. Am.*Cardium (Cerastoderma) pinnulatum*, Dall (1900).

Grand Manan, "in four fathoms, coarse sand" (Stimpson); Bay of Fundy, 2 to 80 fathoms (Verrill); abundant in L'Etang Harbour, Charlotte Co., N.B. (Ganong); Annapolis Basin, not abundant (Verkruzen). Fishing banks off Halifax (Willis); Halifax Harbour (J. M. Jones); Le Have Bank, in 45 and 60 fathoms (Smith and Harger). Northumberland Strait (Whiteaves); Gaspé Bay (Sir J. W. Dawson, and the writer). Packard records *C. pinnulatum* as very common at Salmon Bay, Caribou Island, and says that it did not occur north of the Strait of Belle Isle. But Miss Bush says that a specimen sent by Packard to the Peabody Museum of Yale College, and labelled *C. pinnulatum*, is a young specimen of *C. ciliatum*. The true *C. pinnulatum* is known to range as far to the southward as Long Island Sound.

Dr. G. F. Matthew has found this shell fossil in the Leda clay at Lawlors Lake and St. John, N.B.

CARDIUM (LEVICARDIUM) MORTONI, Conrad.*Cardium Mortoni*, Conrad (1830); and Gould (1841).*Liocardium Mortoni*, Stimpson (1860); and Gould (1870).*Leviocardium Mortoni*, Perkins (1869); and Verrill (1873).*Cardium (Leviocardium) Mortoni*, Dall (1900).

Dartmouth Lakes, Halifax, N.S. (Willis, teste Gould). The only Canadian locality yet known for this species, which ranges as far south as Florida.

SERRIPES GROENLANDICUS (Gmelin).*Venus Islandica*, O. Fabricius (1780); non Linné.*Cardium Grœnlandicum*, Gmelin (1792); et auct.*Aphrodite columba*, Lea (1834).*Serripes Grœnlandicus* (Beck) Gould (1841).

Common at moderate depths (10 to 50 or 60 fathoms) in the Gulf of St. Lawrence and northward to Hudson Strait and Greenland, often associated with *Cardium ciliatum* (*Islandicum*). The species is also known to occur on the Newfoundland Banks (Verkruzen) and on the Atlantic coast of Nova Scotia, southward to Cape Cod, but it has not yet been recorded as having been taken in the Bay of Fundy.

As an American fossil *S. Grœnlandicus* has been found in the pleistocene deposits of Maine, New Brunswick, the Province of Quebec, Labrador and Greenland.

Family *Cyprinidae*.

CYPRINA ISLANDICA (L.).

Venus Islandica, L. (1776).*Cyprina Islandica*, Lamarck (1836); et auct.

Grand Manan, "rarely found" (Stimpson); Bay of Fundy, 6 to 90 fathoms (Verrill); Passamaquoddy Bay (Ganong); St. Mary's Bay and Annapolis Basin (Verkruzen); Atlantic coast of Nova Scotia, common (Willis); northern coast of Northumberland Strait (Whiteaves). Although recorded by Fabricius as a Greenland shell, this species has not yet been found in the Gulf of St. Lawrence, north of the Baie des Chaleurs.

Family *Astartidae*.

ASTARTE LACTEA, Broderip and Sowerby.

Astarte lactea, Broderip and Sowerby (1829); and Gray (1839).

Specimens of an *Astarte*, which agree remarkably well with the description and figures of *A. lactea* in the second volume of the *Thesaurus Conchyliorum*, have been dredged at several localities in the Gulf and mouth of the River St. Lawrence, by the writer and by Sir J. W. Dawson. This shell is by far the largest *Astarte* in these or in any Canadian waters, and is especially abundant on the Bradelle Bank. Willis records it as having been taken many years ago on the fishing banks off Halifax, and more recently it has been collected by Bell at Port Burwell and Ashe Inlet, Hudson Strait.

A. lactea may be the same as the *Crassina semisulcata* of Leach (1819), as stated by Gray and others, but Loven says that Leach's *C. semisulcata* is the same as *C. elliptica*, Brown, which Hanley has shown to be *A. compressa* (L.).

On the other hand, *A. lactea* may be only a local variety of *A. borealis*, Chemnitz (= *A. arctica*, Gray), but it seems to the writer to be distinguishable therefrom by the "strong and regular costellæ," or concentric ribs, "near the beaks," as pointed out by Sowerby. In the half grown shell, for which Reeve is supposed to have suggested the name *A. Richardsons*, the whole surface is concentrically ribbed and the epidermis of a lighter colour.

According to Sir J. W. Dawson, this shell, which he calls "*Astarte arctica*, Möller, (var. *lactea*)," is found fossil in the Pleistocene of New Brunswick and Labrador.

ASTARTE COMPRESSA (L.).

Venus compressa, L. (1767); teste Hanley. Non Montagu.*Crassina elliptica*, Brown (1827).*Astarte semisulcata*, Möller (1842); non Leach.*Astarte elliptica*, McGillivray (1843).

Common at depths of from 10 to 50 (and perhaps 100) fathoms, in the Gulf and mouth of the River St. Lawrence, from the Bradelle and Orphan

banks and Gaspé Bay, northward to Hudson Strait and Greenland. Verrill says that he has dredged but one specimen of it on the New England coast (off Casco Bay, 65 fathoms), and it has been taken on the Le Have Bank, N.S., by Smith and Harger. In the Bay of Fundy and Northumberland Strait its place is taken by the finely ribbed variety of *A. undata*. The specimens from Gaspé Bay and the Gaspé peninsula that were identified with *A. sulcata* by Sir J. W. Dawson, in 1858, and by Bell, in 1859, and with *A. undata* by the writer, in 1869, are all forms of *A. compressa*, L. The statement made on page 236 of Sir J. W. Dawson's memoir on the "Ice Age in Canada," on the authority of the writer, to the effect that "I regard this as *Astarte lactea*, Brod. and Shy., and *A. semisulcata*, Leach; but as probably distinct, as *Astartes* go, from *A. borealis* (= *A. arctica*), is misplaced. It was intended to refer to the species which Sir William calls *Astarte arctica*, var. *lactea*, and not to that which he identifies with *A. elliptica*.

In a fossil state, *A. compressa* has been found at Portland, Maine, the Saguenay and Labrador.

ASTARTE UNDATA, Gould.

Astarte undata, Gould (1841); provisional name.

Astarte sulcata, Gould (1841 and 1870); not of European writers.

Crassina latisulca, Hanley (1843).

Astarte undata, Philippi (1850); and Verrill (1872).

Var. LUTEA:

Astarte lutea, Perkins (1869).

Grand Manan, "common in deep water on muddy bottoms," (Stimpson as *A. sulcata*, Fleming); "very common in Casco Bay and Bay of Fundy, 5 to 100 fathoms" (Verrill); Minas Basin (G. T. Kennedy); Passamaquoddy Bay (Ganong); Annapolis Basin, abundant (Verkruzen); Halifax Harbour (J. M. Jones, as *A. sulcata*, Fleming); Northumberland Strait (Whiteaves). Not known to occur as far to the northward as Miramichi Bay.

It has long been known that there are two well marked forms of this species, though they pass insensibly into each other. The typical form, upon which Hanley based his *C. latisulca*, has distant and comparatively few concentric ribs. The other form, or var. *lutea* (which Verrill identifies with *A. lutea*, Perkins) has rather more numerous concentric ribs, and more closely resembles the British *A. sulcata*. In the Bay of Fundy and in the Minas Basin, both forms occur together, but in Northumberland Strait, so far as the writer can remember, it is only the var. *lutea* that has been found.

ASTARTE CREBRICOSTATA, Forbes.

? *Crassina depressa*, Brown (1844) variety; fide Jeffreys.

Astarte crebricostata, Forbes (1847); Forbes and Hanley (1848); et auct.

In 1871, 1872 and 1873 several living examples of a peculiar little *Astarte* with regular and rather numerous concentric ribs and a light brownish-yellow epidermis, were dredged by the writer in the deep sea mud (112 to 313 fathoms) of the Gulf of St. Lawrence, to the north, south and south east of the Island of Anticosti. Those collected in 1871 were at first identified by Jeffreys with *A. sulcata*, var. *minor*, but they were regarded by Verrill as probably a dwarf form of *A. lens*, Stimpson. Subsequently, the writer came to the conclusion that the whole of these specimens represent a small, local variety of *A. crebricostata*, also that they are probably identical with the *A. subaequilatera* and possibly with the *A. oblonga* of Sowerby. In a letter to the writer, dated May 26, 1876, Jeffreys expressed the opinion that they are "apparently a dwarf form of *Crassina depressa*, Brown (= *A. crebricostata*, Forbes)." The late Dr. P. P. Carpenter, to whom a few specimens were submitted a little later, furnished the following notes upon them: "I cannot perceive any difference at all, inside or out, by which these can be separated from some of the *A. crebricostata*, Forbes, dredged at Finmark by McAndrew. Yours, being eroded at the beak, look different, and the largest of yours is very small compared with the Finmarkians. Moreover some of yours have fewer ribs in proportion; but others *exactly* correspond. Your shells show considerable variations in outline, the Finmarkians are very uniform. I have put a mark against a shell on your tablet, that would make a good *crebricostata*. I should take your shells to be the *A. subaequilatera* of Sowerby, junior, as I think was your opinion. One of your transverse ones, which I have also marked, would do sufficiently well for *A. oblonga*, Sowerby, junior, were it not that the ribs do not evanesce as there described. Every one finds *Astartes* puzzling."

Professor Verrill thinks that the shell described and figured by Gould as *A. crebricostata*, in the second edition of the Invertebrata of Massachusetts, is not the *A. crebricostata* of Forbes, and that the former should be called *A. lens*, Stimpson. The shell that Gould identifies with *A. crebricostata* is said to have been collected off Halifax, N.S., ("young specimens in abundance") by Willis; at Anticosti Island (Stimpson); and at Dauphin Harbour, Labrador, by Packard. Verrill says that *A. lens* occurs in the Bay of Fundy on soft bottoms in 30 to 130 fathoms.

ASTARTE CRENATA, Gray.

Off Bear Head, Anticosti, in 120 fathoms; two living specimens, which were dredged by the writer in 1871 and identified with this species by Jeffreys in 1877. Three very similar specimens have since been dredged

(living) in Richmond Gulf, Hudson Bay, in 15 to 25 fathoms, muddy bottom, by A. P. Low, in 1899.

The whole surface of each valve of St. Lawrence specimens of *A. crebricostata*, as its name implies, is concentrically ribbed. Thus, in a specimen about 20 mm. in length, there are about twenty-one distinct and prominent concentric ribs, and if the beaks had not been a little eroded, there would have been a few more. But, in specimens of *A. crenata* from the same region, the ribbing is much finer and it would seem that it is only the upper half of each valve (i. e. the part inclusive of the beak, and half way to the ventral margin) that is ribbed, the lower half being coarsely and irregularly striated concentrically. The largest St. Lawrence specimen of *A. crenata* that the writer has seen is 25 mm. long, and on its outer surface there are about 25 concentric ribs in the upper half of each valve. The three comparatively small specimens from Hudson Bay are irregularly striated all over.

ASTARTE CASTANEA, Say.

Venus castanea, Say (1822).

Astarte castanea, Say (1830); et auct.

Bay of Fundy, 5 to 20 fathoms, not common (Verrill); Annapolis Basin, N.S., rare (Verkruzen); Indian Springs, east side of Cape Blomidon, Minas Basin, 1875 (G. T. Kennedy); Halifax Harbour (Willis); off Cape Sable, N.S. (Verrill); Sable Island, 1899 (Prof. Macoun).

A New England species, which does not seem to range farther to the northward than the Bay of Fundy and Atlantic coast of Nova Scotia.

ASTARTE QUADRANS, Gould.

Astarte quadrans, Gould (1841 and 1870).

Astarte Portlandica, Mighels (1843); variety.

Grand Manan, "occurs very rarely here" (Stimpson); Bay of Fundy, in 6 to 40 fathoms, not uncommon (Verrill); north shore of the St. Lawrence, off Esquimaux Point (J. Richardson, Jun.)

The "var. *Portlandica* occurs, with intermediate forms, in Casco Bay and Bay of Fundy, 10 to 25 fathoms, not common;" (Verrill).

ASTARTE BANKSII (Leach). Typical form.

Venus compressa, Montagu (1808); non L.-Fide S. Wood, and G. O. Sars.

Venus Montacuti, Dillwyn (1817).

Nicania Banksii, Leach (1819); and Sabine (1824) teste Möller.

Venus Montagu, W. Wood (1826).

Astarte Banksii, Möller (1842).

Nicania Banksii, forma *typica*, G. O. Sars (1878).

Off Halifax, N.S. (Stimpson, fide Packard); Le Have Bank, N.S., U. S. Fish Commission, 1872, (Smith and Harger). Common in the northern and

colder parts of the Gulf and mouth of the River St. Lawrence, in depths of some 10 to 60 fathoms, northward to Labrador, Hudson Strait and Greenland. On the "Diana" exploring expedition to Hudson Bay in 1897, specimens of it were dredged by Mr. A. P. Low between King George Sound and the bottom of Ungava Bay. Some specimens dredged off Grande Grève, Gaspé Bay, by the writer in 1867, were pronounced by Mr. Hanley (in 1868) to be the exact variety of *A. Banksii* figured in Beechey's Zoology of the Beagle.

If *A. Banksii* is the same as the *Venus compressa* of Montagu, but not of Linnaeus, as maintained by Searles Wood and G. O. Sars, and the preceding dates are correct, the laws of priority would seem to require that the present species should be called *A. Montacuti* (Dillwyn).

However this may be, as a North American quaternary fossil, *A. Banksii* is recorded by Sir J. W. Dawson as having been collected in the Leda clay at Portland, Maine; at St. John, N.B.; at Anticosti, Little Métis, Rivière du Loup, Kamouraska, Quebec, and Montreal, P.Q.; also at Labrador.

ASTARTE BANKSII, var. GLOBOSA.

Astarte globosa, Möller (1842).

Nicania Banksii, var. *globosa*, G. O. Sars (1878).

Entrance to Gaspé Bay, where an unusually large living specimen, which measures—length 28 mm., height 25 mm., breadth, or greatest thickness through both valves, 16 mm.,—was dredged by the writer in 1867. A few much smaller specimens were dredged on the north shore of the St. Lawrence, off Egg Island, in 70 to 80 fathoms, by the writer in 1871.

ASTARTE BANKSII, var. STRIATA.

Nicania striata, Leach (1819).

Crassina striata, Brown (1827).

Astarte striata, Brown (1844); Möller (1842); et auct., but not

A. striata, Sowerby (1822) teste Loven.

Astarte Banksii, var. *striata*, G. O. Sars (1878).

Specimens that have been identified with *A. striata* have been recorded as having been collected from the fishing banks off Halifax, by Willis, in Gaspé Bay by the writer, at Murray Bay by Sir J. W. Dawson, on the Labrador coast at Hopedale by Packard, and on the Greenland coast by Möller. Packard has expressed the opinion that *A. Laurentiana*, Lyell, from the Pleistocene deposits at Beauport, is identical with *A. Banksii*, and Sir J. W. Dawson that it is the same as *A. striata*. In the writer's judgment, no living specimens that he has seen, from the Gulf of St. Lawrence or elsewhere, are exactly similar to *A. Laurentiana*.

Family *Carditidae*.

VENERICARDIA BOREALIS (Conrad).

- Cardita borealis*, Conrad (1831) ; and Gould (1841, 1870).
Actinobolus borealis, H. and A. Adams (1858).
Venericardia borealis, Carpenter (1863).
Cyclocardia borealis, Verrill (1873).

Generally distributed from Connecticut to Hudson Strait. It has been dredged at many localities in the Bay of Fundy, Atlantic coast of Nova Scotia, and Gulf and mouth of the River St. Lawrence, in depths of from 3 to 50 fathoms. Stimpson says that at Duck Island, Grand Manan, it is found "at low water, under stones, attached by a minute byssus." Fine large specimens of this shell, in the Museum of the Survey, were dredged at Ashe Inlet, Hudson Strait, by Dr. R. Bell in 1884. The species has long been known to occur on the Pacific coast of North America, as far south as Catalina Island, California, and it has been dredged at several localities in the Queen Charlotte Islands by Dr. G. M. Dawson. According to Verrill,* the *Actinobolus* (*Cyclocardia*) *Novangliæ* of Morse, appears to be only an inconstant variety of the common *V. borealis*, and has a range co-extensive with the latter.

In a fossil state *V. borealis* has been obtained from the Pleistocene beds of the Labrador coast, by Packard in 1864.

Family *Veneridae*.

VENUS MERCENARIA, L.

- Venus mercenaria*, L. (1767); et auct.
Mercenaria violacea, Schumacher (1817).
Mercenaria mercenaria, Chenu (1862).
Crassivenus mercenaria, Perkins (1869).

One of the most characteristic shallow water species of the southern and warmer areas of the region under consideration, with a very similar range to that of the common oyster of eastern Canada. According to Willis, J. M. Jones and others, *V. mercenaria* is common at Sable Island and on the Atlantic coast of Nova Scotia. Verkrusen says it is "pretty abundant" at St. Mary's Bay, on the Nova Scotian side of the Bay of Fundy, and it is known to occur throughout Northumberland Strait, as far to the north-westward as Bathurst, on the south shore of the Baie des Chaleurs, where it was collected by Mr. R. Chalmers in 1878.

* Transactions of the Connecticut Academy of Arts and Sciences, vol. v., p. 572.

TOTTENIA GEMMA (Totten).

Venus gemma, Totten (1834).

Gemma gemma, Deshayes (1853).

Gemma Totteni, Stimpson (1860).

Tottenia gemma, Perkins (1869).

Grand Manan (Verrill); fishing banks off Halifax, rare, (Willis); Prince Edward Island (Sir J. W. Dawson); Shediac Bay (Whiteaves); Green Island, south shore of the mouth of the River St. Lawrence (Bell); and Indian Harbour, Labrador, at low water (Packard).

CYTHEREA CONVEXA, Say.

Cytherea convexa, Say (1824) fossil; Gould (1841 and 1870) recent.

Cytherea Sayana, Conrad (1833); recent.

Callista convexa, H. and A. Adams (1858).

Cytherca Sayii, Perkins (1869).

Oak Bay, N.B. (Ganong); St. Mary's Bay, N.S., at low tides, rare (Verkrutzen); Sable Island, rare (Willis); Shediac Bay,—Northumberland Strait,—and Magdalen Islands (Whiteaves); Prince Edward Island (Sir J. W. Dawson).

LIOCYMA FLUCTUOSA (Gould).

Venus fluctuosa, Gould (1841).

Venus astartoides, Beck (1849).

Tapes fluctuosa, Gould (1870).

Liocyma fluctuosa, Dall (1870).

Widely distributed from the Atlantic coast of Nova Scotia to Labrador and Greenland, in from 10 to about 50 fathoms, but apparently local, though usually abundant where found. Willis quotes it as rare on the fishing banks off Halifax; and the writer has dredged it abundantly, living, both on the Bradelle Bank and in Gaspé Bay. Packard says that he dredged a single valve of it on the bank near Caribou Island, (in 1860), and that he subsequently (in 1864) found it not uncommon in Henley Harbour and off Square Island, Labrador. Miss Bush also records its having been taken by the Stearns Labrador expedition (in 1882) at L'Anse au Loup and Henley Harbour, in 10 to 15 fathoms; and Beck, at Mahls-alik, Greenland.

The shells of living specimens of this species are usually white, with a very thin hyaline outer layer, the surface of which has a highly polished appearance, but exceptionally they are of a pale reddish brown colour, and even approaching to orange.

Family *Petricolidæ*.

PETRICOLA PHOLADIFORMIS, Lamarck.

Petricola pholadiformis, Lamarck (1818); and Say (1834).

Petricola fornicata, Say (1822).

Petricola dactylus, Say (1834); and Gould (1841 and 1870).

St. Mary's Bay, N.S. (Verkruzen); Sable Island, rare (Willis); south coast of Prince Edward Island, burrowing in reefs of red sandstone and shale (Sir J. W. Dawson, and F. Bain); Shediac Bay, and elsewhere in Northumberland Strait (Whiteaves).

Family *Diplodontidæ*

CRYPTODON GOULDII, Philippi.

Lucina flexuosa, Gould (1841); non Montagu, sp.

Lucina Gouldii, Philippi (1843).

Thyasira Gouldii, Stimpson (1851).

Cryptodon Gouldii, H. and A. Adams (1858); et auct.

Widely but apparently very sparingly distributed through the whole region, from the Bay of Fundy, Atlantic coast of Nova Scotia and Gulf and mouth of the River St. Lawrence, to Labrador and Greenland, at depths of about 10 to 313 fathoms.

According to Sir J. W. Dawson, shells of this species are rare in the Leda clay of Montreal.

CRYPTODON OBESUS, Verrill.

1872. Amer. Journ. Sc. and Arts, Third Series, vol. III., p. 287.

Off Nova Scotia, Verrill; who says also that he has detected one specimen of this species among the shells, etc., dredged by Packard in 1864 on the Labrador coast.

CRYPTODON PLANUS, Verrill and Bush.

1898. Proc. U.S. Nat. Mus., vol. XX., p. 788.

"Found in 8 to 100 fathoms, north of Cape Cod, in the Gulf of Maine, Casco Bay, Bay of Fundy and Halifax Harbour, 1872, 1885" (Verrill and Bush).

CRYPTODON (AXINULUS) FERRUGINOSUS (Forbes).

Cryptodon rotundatum, S. Wood (1840).

Kellia ferruginosa, Forbes (1843).

Axinus ferruginosus, G. O. Sars (1878).

Cryptodon ferruginosus, Verrill (1882).

Cryptodon (Axinulus) ferruginosus, Verrill and Bush (1898).

Gulf of St. Lawrence, south and south east of the Island of Anticosti, in 200–313 fathoms, mud, dredged by the writer in 1873; a few small but living specimens, which are believed to be referable to this species.

CRYPTODON (AXINULUS) INÆQUALIS, Verrill and Bush.

1898. Proc. U.S. Nat. Mus., vol. xx., p. 791.

"A few specimens have been found in 14 to 49 fathoms at about eleven stations north of Cape Cod, in Casco Bay, and in Halifax Harbour, 1873–79" (Verrill and Bush).

AXINOPSIS ORBICULATA, G. O. Sars, var. INÆQUALIS, Verrill and Bush.

1898. Op. cit., vol. xx., p. 794.

Bay of Fundy (Verrill and Bush).

Family *Leptoniidae*.

KELLIA SUBORBICULARIS (Montagu).

Mya suborbicularis, Montagu (1804).

Kellia suborbicularis, Turton (1822); et auct.

"Sable Island, Willis," in J. Matthew Jones' "List of the Mollusca of Nova Scotia," published in 1877, though the writer has failed to find the name of this species in Willis' 1863 list, as republished in vol. vii. of the Transactions of the Nova Scotia Institute of Natural Science.

ROCHEFORTIA MOLLERI (Mörch).

Montacuta elevata, Mörch (1875); not Stimpson (1851).

Mysella Mollerii (Holböhl) Mörch.

Rochefortia Mollerii, Fall (1900).

Halifax Harbour, in 18 fathoms, U. S. Fish Commission, 1877 (Miss Bush).

It is doubtful whether the specimens from Sable Island that Willis identified with the *Kellia planulata* of Stimpson, should be referred to *Rochefortia planulata* or to *R. Mollerii*.

Family *Kelliellidae*.

TURTONIA MINUTA (Fabricius).

Venus minuta, O. Fabricius (1780).

Lesaea minuta, Müller (1842).

Turtonia minuta, Alder (1848); and Stimpson (1851).

Turtonia nitida, Verrill (1872).

Sable Island, common (Willis); Greenland (Fabricius, and Moller

Family *Macridae*.

SPISULA (HEMIMACTRA) SOLIDISSIMA (Dillwyn).

Macra solidissima, Dillwyn (1817); fide Dall.

Macra similis, Say (1822).

Macra gigantea, Lamarck (1830).

Macra solidissima, Gould (1841).

Macra ponderosa, Philippi (1844).

Hemimactra solidissima, Conrad (1868).

Spisula (Hemimactra) solidissima, Dall (1895).

An inhabitant of sandy stretches or bays, living at depths of from low-water to ten fathoms. It is common in the Bay of Fundy, on the Atlantic coast of Nova Scotia, and in Northumberland Strait, and it is also found, though much more sparingly, in the Gulf of St. Lawrence, northward to the Strait of Belle Isle.

SPISULA (HEMIMACTRA) POLYNIMA (Stimpson).

Macra similis, Gray (1842); non Say.

Macra ovalis, Gould (1841 and 1870); non J. Sowerby (1817).

Macra ponderosa, Stimpson (1851).

Macra polynima, Stimpson (1860).

Spisula (Hemimactra) polynima, Dall (1895).

A scarcer shell than the preceding, of which it may be only a variety. It has a similar habitat and the same geographical distribution.

MULINIA LATERALIS (Say).

Macra lateralis, Say (1822).

Mulinia lateralis, Gray (1837).

Standella lateralis, H. and A. Adams (1858).

About ten miles north of Shediac, N.B., in 10 fathoms, sand; one specimen, dredged by the writer in 1873.

Family *Mesodesmatidae*.*MESODESMA DEAURATUM* (Turton).*Mastra deaurata*, Turton (1822).*Mesodesma Jauresii*, De Joannis (1834); and Gould (1841).*Ceronia deaurata*, H. and A. Adams (1858); and Gould (1870).

Under the generic name *Ceronia*, both *M. deauratum*, and *M. arctatum* (Conrad) are said to be rare on the fishing banks off Sable Island, by Willis in his latest (1863) list of Nova Scotia shells. On the authority of the late Dr. Gould, Dr. R. Bell referred to *M. arctatum* the specimens that he collected on the south shore of the lower St. Lawrence below Green Island, in 1858. On the other hand, Dr. Packard identified with *M. Jauresii* (a synonym of *M. deauratum*) all the specimens that he found thrown up abundantly on beaches near Caribou Island, in 1860. And, following Dr. Packard, all the specimens collected at Little Métis in 1867, and off Magpie village (on the north shore of the St. Lawrence) in 1871, by the writer, and at Tadoussac by Sir J. W. Dawson, have been referred to *M. deauratum*.

The writer has long been under the impression that there is only one species of *Mesodesma* in Canadian waters, and that the distinction between *M. arctatum* and *M. deauratum* can scarcely be satisfactorily maintained. Young or not quite adult specimens, with the valves covered with a yellowish and sometimes slightly iridescent epidermis agree in that respect with the description of *M. arctatum*; whereas adult and aged specimens, with only a narrow strip of pale ashen gray epidermis around the ventral margin, correspond better with that of *M. deauratum*. Judging by the figures in the second edition of Dr. Gould's Invertebrata of Massachusetts, the principal difference between these two forms would seem to be that in *M. arctatum* the short posterior end is so abruptly subtruncate that the beaks are almost terminal; whereas in *M. deauratum* the same part of the shell is somewhat produced. In this particular, all the Canadian specimens that the writer has seen, agree better with the figure of *M. arctatum* than with that of *M. deauratum*.

In a letter dated Feb. 18th, 1901, Dr. Dall writes as follows on this point. "In regard to the *Mesodesmas* Stimpson recognizes three forms :

arctatum, Conrad (1831). *cinerea*, Stimpson (M.S.) | *deauratum*, Turton (1822)

Anterior end more pointed.
Flattened.
Posterior end shorter.
Straw yellow.
Rather thin.
Radial lines obvious.
Shell broad.

do.
targid.
shorter.
ashy.
very thick.
obsolete.
broad.

more rounded.
flattened.
longer and more angular.
yellowish.
thin.
do.

"I am not dogmatic about them, but would be disposed to recognize two, at least, one turgid and short in front, the other flatter and longer." "They are very close to each other at best, and all found in the Gulf" of St. Lawrence.

Family *Scrobiculariidae*.

CUMINGIA TELLINOIDES (Conrad).

Macra tellinoides, Conrad (1831).

Cumingia tellinoides, Holmes (1859); Verrill (1875).

Prince Edward Island, only one specimen seen (Sir J. W. Dawson, 1871); south shore of P.E.I. (F. Bain, 1875).

Family *Tellinidae*.

TELLINA (ANGULUS) TENERA, Say.

Tellina tenera, Say (1822).

Tellina (Angulus) tenera, H. and A. Adams (1858).

Angulus tener, Verrill (1872).

Bay of Fundy (Verrill); St. Mary's Bay, N.S. (Verkrutzen); fishing banks off Halifax, scarce (Willis). Shediac Bay, at or a little below low-water mark (Whiteaves); south coast of Prince Edward Island (F. Bain); and Gaspé Bay (Sir J. W. Dawson).

MACOMA BALTHICA (L.)

Tellina Balthica, L. (1758); fide Dall.

Venus fragilis, O. Fabricius (1780); non L.

Psammobia fusca, Say (1827); fide Dall.

Sanguinoluria fusca, Conrad (1831); and Gould (1841).

Tellina Greenlandica (Beck) Lyell (1839).

Tellina fragilis, Möller (1842); non L.

Tellina (Macoma) tenera, Mörch (1857); non Say; fide Dall.

Macoma fragilis, H. and A. Adams (1858).

Macoma fusca, Packard (1867).

Common throughout the entire region, usually at or a little below low-water mark. It is abundant on the shores of the Maritime Provinces, and Dall says that it ranges "in cool water south to Georgia." In the Gulf of St. Lawrence it is widely distributed, and it has been found as far up the river as Kamouraska by Sir J. W. Dawson. Packard records it as abundant on the Labrador coast, and Fabricius and Möller found it at Greenland. It is a circumpolar species, and specimens from British Columbia have usually been catalogued as *Macoma inconspicua* (Broderip and Sowerby). On the Pacific it has been collected in northern Japan, and as far south on the

north-west coast as Monterey, California. It is "abundant about Bering Sea." "The original *Tellina Balthica* was the thin form from the Baltic, not the solid *Tellina solidula*, Pulteney, which is better known to collectors." "The former is identical with our common American type" (Dall).*

With *Saxicava rugosa* this species occurs in enormous numbers in the Saxicava sand at many localities in the St. Lawrence and Ottawa valleys, etc., and it has been found also in the Leda clay. In the St. Lawrence valley it has recently been collected by Mr. R. Chalmers as far to the westward as Brockville, Ont.

MACOMA CALCAREA (Gmelin).

Tellina calcarea, Gmelin (1792).

Tellina lata, Gmelin (1792).

Tellina sabulosa, Spengler (1794).

Macoma tenera, Leach (1819).

Tellina sordida, Couthouy (1838).

Tellina proxima, (Brown, M. S.) Sowerby (1839); et auct.

Sanguinolaria sordida, Gould (1841).

Macoma sabulosa, Stimpson (1860); and Packard (1867).

Macoma proxima, Gould (1870).

From Long Island Sound northward to Nova Scotia, the Gulf and mouth of the River St. Lawrence, Labrador, Hudson Bay and Strait, to Greenland and the Arctic Ocean, in from 3 to 80 fathoms. It is found on both sides of the Atlantic and has been taken on the coast of British Columbia. Dall (op. cit.) says that it occurs in the "Arctic Ocean generally, and on the Pacific south to the Okhotsk and Japan seas on the west, and to the Aleutians and Oregon on the east." Dr. Bell dredged several specimens of it at Ashe Inlet and Port Burwell, Hudson Strait, in 15 fathoms, in 1884. Still more recently, Mr. Low has dredged similar specimens on the south side of Hudson Strait, between King George Sound and the bottom of Ungava Bay, in the summer of 1897, while accompanying the Diana exploring expedition; on the east coast of Hudson Bay, near the mouth of the Povungnituk River, in 10 to 15 fathoms, in 1898; and in Richmond Gulf, on the east coast of Hudson Bay, in 15 to 25 fathoms, in 1899.

In a fossil state Sir J. W. Dawson says that this species is extremely abundant in the Leda and boulder clays of eastern North America, and that it has been found in the Pleistocene deposits of Maine; at Duck Cove, St. John, N.B.; at New Richmond, Anticosti, Rivière des Outardes, Rivière du Loup, Murray Bay, Quebec, Chaudière Station, and Montreal, P.Q.; also at Labrador, Greenland, and northern Europe. It has also been found fossil on the east coast of Hudson Bay, two or three miles up Little Whale River, by Dr. Bell, in 1877; at James' Bay, near Moose Factory, by A. S. Cochrane, in 1877; and at the Limestone Rapid of the Fawn Branch of the Severn River, Keewatin, by A. P. Low in 1886.

MACOMA INFLATA, Verrill and Bush.

Macoma inflata (Stimpson M. S.) Dawson (1872). Name only.

Macoma inflata, Verrill (1882). Name only.

Macoma inflata, Verrill and Bush (1898). Figured, but not described.

Murray Bay, P.Q. (Sir J. W. Dawson). The writer has dredged living specimens of this shell off Grande Grève, Gaspé Bay, in 1869; off Cap des Rosiers, in 38 fathoms, and six miles off Cap des Rosiers, in 125 fathoms, in 1871; and eleven miles from Percé, in 60 fathoms, in 1872.

M. inflata has also been found in the Pleistocene deposits of Rivière du Loup and Montreal.

"This species was named by Stimpson in manuscript, and the name published by Dawson, but the first real definition of" its "name is by Verrill and Bush" * (Dall).

Family Solenidae.

ENSIS DIRECTUS (Conrad).

Solen ensis, Conrad (1842); non Linné.

Solen directus, Conrad (1843); teste Dall.

Solen Americanus, Gould (1870).

Ensatella Americana, Verrill (1872).

Ensis directus, Dall (1900).

Grand Manan (Stimpson); Bay of Fundy, low-water mark to 40 fathoms, sand (Verrill); Hospital Island, Passamaquoddy Bay (Ganong); Atlantic coast of Nova Scotia and Sable Island, common (Willis). Shediac Bay (Whiteaves); near Charlottetown, P.E.I., Professor Macoun; Gaspé Bay and Little Métis (Sir J. W. Dawson); Bic, Rimouski, and numerous localities on the Gaspé coast (Bell); near Caribou Island, P.Q. (Packard).

SILIQUA COSTATA (Say).

Solen costatus, Say (1822).

Machæra costata, Gould (1841 and 1870).

Siliqua costata, H. and A. Adams (1858).

Fishing banks off Halifax (Willis); beach at Amherst Harbour, Magdalen Islands (Whiteaves); Gaspé Bay (dead shells on beach), and Little Métis Bay (Sir J. W. Dawson); Rimouski (Bell). "Not observed in the Bay of Fundy" (Verrill).

SILIQUA SQUAMA (Blainville).

Solecurtus squama, Blainville.

Machæra nitida, Gould (1841).

Machæra squama, Stimpson (1851); and Gould (1870).

Siliqua squama, H. and A. Adams (1858).

Fishing banks off Halifax, rare (Willis).

* Proceedings of the U.S. National Museum, vol. XXIII. (1900) p. 299.

Family *Solenomyidae*.

SOLENOMYA VELUM, Say.*

Solenya velum, Say (1822); Gould (1841 and 1870); et auct.

Fishing banks off Halifax, very rare (Willis).

SOLENOMYA BOREALIS, Totten.

Solenya borealis, Totten (1834); and Gould (1841 and 1870).

Fishing banks off Halifax, very rare (Willis); Halifax Harbour, rare (Verrill).

Family *Pandoridae*.

CLIDIOPHORA GOULDIANA, Dall.

Pandora trilineata, Gould, et auct., but not of Say.

Clidophora Gouldiana, Dall (1886. Bull. Mus. Comp. Zool., vol. XII., p. 312).

„ Off Grand Manan Island, in 5 fathoms, mud (Stimpson); Bay of Fundy, low-water mark to 30 fathoms (Verrill); St. Mary's Bay (Verkruzen); Sable Island, rare (Willis); Halifax Harbour, rare, "I have only dredged single valves" (J. M. Jones). Between Cape Breton and Prince Edward islands, at many localities; also Northumberland Strait, north of Pictou Island, N.S., and westward to Shediac Bay, N.B., from low-water mark (blown ashore by gales) to 20 or 30 fathoms; where specimens were dredged or collected by the writer in 1873.

KENNERLIA GLACIALIS (Leach).

Pandora glacialis (Leach) Sowerby (1830).

Kennerlia glacialis, Carpenter (1864).

Off Grande Grève, Gaspé Bay, in 30 to 50 fathoms, where a few small specimens were dredged by the writer in 1869; Little Métis and Murray Bay (Sir J. W. Dawson). The specimens from the north shore of the Gulf of St. Lawrence, near Caribou Island, in 15 fathoms sand, that have been identified by Packard with *Pandora trilineata*, are probably referable to this species, and Miss Bush says that three specimens of it, sent by Dr. Packard to the Peabody Museum of Yale College, were labelled *Pandora trilineata*, Say. *K. glacialis* has been found fossil in the Leda clay of Saco, Maine, and St. John, N.B.

* Generic name amended by Dr. Paul Fischer in 1887.

LYONSIA ARENOSA (Möller).

Pandorina arenosa, Möller (1842).

Lyonsia (Pandorina) arenosa, Mörch (1857).

A Greenland shell that Verkrusen collected in Annapolis Basin; that Willis says is rare on the fishing banks off Halifax; and that J. Matthew Jones records as occurring in Halifax Harbour. Specimens of it have been dredged in Gaspé Bay in 30 to 60 fathoms, by the writer; at Little Métis, Rivière du Loup and Murray Bay, by Sir J. W. Dawson; at Ste. Anne, by Bell (who identified his specimens with *Osteodesma hyalinum*); and near Caribou Island, in 15 fathoms sand, by Packard.

The outer surface of the valves of young and living specimens is covered with a layer of fine sand, but the woodcut on page 66 of the second edition of Gould's Invertebrata of Massachusetts does not give a very good idea of this shell, some specimens of which are fully an inch in length.

According to Sir J. W. Dawson, *L. arenosa* has been found fossil in the Leda clay of Saco, Maine; of Duck Cove, N.B.; of Rivière du Loup and Montreal, P.Q.; and in post-tertiary deposits in Greenland.

LYONSIA HYALINA, Conrad.

Mya hyalina, Conrad (1831).

Lyonsia hyalina, Conrad (1831); and Gould (1870).

Osteodesma hyalina, Couthouy (1839).

Grand Manan, 10 fathoms sand, off Cheney's Head (Stimpson); Bay of Fundy, low-water mark to 30 fathoms (Verrill).

Family Anatinidae.

PERIPLOMA FRAGILIS (Totten).

Anatina fragilis, Totten (1835).

Anatina papyracea, Gould (1841 and 1870); non Say, teste Dall.

Periploma papyracea, Verrill (1872).

Periploma fragilis (Conrad) Dall.

Sable Island (Willis); "not uncommon in Massachusetts Bay, Casco Bay and Bay of Fundy, 10 to 100 fathoms" (Verrill). Gaspé Bay, in 40 fathoms mud,—and off Egg Island (on the north shore of the Gulf of St. Lawrence, between Trinity and Seven Island bays) in 70–80 fathoms sandy mud" (Whiteaves); off Anticosti Island (Verrill); and Chateau Bay, Labrador, in 15 fathoms, sandy bottom (Packard).

COCHLODESMA LEANUM (Conrad).

Anatina Leana, Conrad (1831).

Cochloidesma Leanum, Couthouy (1839); et auct.

Fishing banks off Halifax, scarce (Willis); off Douglastown, Gaspé Bay, one dead but fresh valve collected by the writer in 1869.

THRACIA CONRADI, Couthouy.

Thracia declivis, Conrad (1831); non Pennant.

Thracia Conradi, Couthouy (1839); et auct.

Grand Manan (Stimpson); Bliss Harbour, N.B. (Ganong). Off Pictou Island, N.S., in 12 fathoms (alive); Pointe du Chêne, Shediac Bay (dead and empty but large and perfect shells, thrown up on or near the beach by a storm); and off Grande Grève, Gaspé Bay, (Whiteaves). One small specimen was dredged off Caribou Island (Packard).

This species, Verrill says, "burrows so deeply in the mud or sand; that it is seldom taken alive in the dredge."

THRACIA MYOPSIS (Beck) Möller.

Thracia myopsis, (Beck) Möller (1842); et auct.

Thracia Couthouyi, Stimpson (1851).

Grand Manan (Stimpson): Halifax Harbour (Smith and Harger); off Grand Grève, Gaspé Bay, in 50 fathoms mud (Whiteaves); Salmon Bay (on the north shore of the Gulf, just inside of the Strait of Belle Isle) in 10 fathoms mud ("a fine large specimen"), and Long Island (Sandwich Bay, Labrador) in 15 fathoms sand (Packard); Greenland (Möller).

The late Dr. J. Gwyn Jeffreys was of the opinion that this shell is the *Amphidesma truncatum*, Brown (Illustr. Conch. Gt. Britain, 1827) and that it should be called *Thracia truncata* (Brown). G. O. Sars, in his *Mollusca Regionis Arcticæ Norvegicæ*, published in 1878, adopts this view, and regards *T. myopsis* as a synonym of *T. truncata*.

THRACIA TRUNCATA, Mighels and Adams.

Thracia truncata, Mighels and Adams (1842); and Gould (1870).

Grand Manan, "in 10 fathoms coarse sand off Cheney's Head" (Stimpson); Bay of Fundy (Verrill); fishing banks off Halifax, scarce (Willis); Greenland, in 60 fathoms (Mörch).

Dr. Jeffreys has suggested that as the specific name given to this shell by Mighels and Adams is preoccupied, it should be changed to *T. septentrionalis*.

Family *Cuspidaridae*.

CUSPIDARIA GLACIALIS, G. O. Sars.

Necera glacialis, G. O. Sars (1878); et auct.*Cuspidaria glacialis*, Dall (1886).*Cuspidaria arctica*, var. *glacialis*, Dall (1889).

A few living specimens of a shell which Jeffreys, Verrill, and the writer formerly identified with *Necera arctica*, M. Sars, but which Verrill now calls *Cuspidaria glacialis*, were dredged by the writer in 1871, 1872 and 1873, from the deep sea mud (170–313 fathoms) in the Gulf of St. Lawrence, at several localities to the north, and more especially to the south and south-east of the Island of Anticosti. Verrill has dredged similar specimens in the Bay of Fundy, and says that the species is "common on muddy bottoms, in 50 to 192 fathoms, off the coasts of New England and Nova Scotia."

Jeffreys has expressed the opinion that *Necera* (or, as it is now called, *Cuspidaria*) *glacialis*, is only a variety of *Necera obesa*, Loven; but Dall regards the former as a variety of *N. arctica*.

CUSPIDARIA ARCTICA (M. Sars).

Necera arctica, M. Sars (1872); and G. O. Sars (1878).*Cuspidaria arctica*, Dall (1886).

"A single imperfect valve from station 70, south of Halifax, Nova Scotia, in 190 fathoms, is referred to this species. Though worn and slightly broken, it agrees closely with Sars' figure, but it cannot be fully grown, for it measures but 14 mm. in length, and 11 mm. in height" (Verrill).*

CUSPIDARIA PELLUCIDA (Stimpson).

Necera pellucida, Stimpson (1853).*Cuspidaria pellucida*, Verrill (1898).

Grand Manan, "off Long Island, in 40 fathoms, on a muddy bottom" (Stimpson); the specimen from which the original description was made. Professor Verrill states that similar specimens have since been obtained at nearly the same locality by the U. S. Fish Commission. In 1871 the writer dredged a few shells, which were then identified with *Necera obesa*, Loven, in the deep sea mud (100–313 fathoms) of the Gulf of St. Lawrence, north of the Baie des Chaleurs. "After a careful study and comparison of the numerous species belonging to the family Cuspidaridae," Professor Verrill and Miss Bush say that they "have been able to satisfactorily prove that

* Proceedings of the U.S. National Museum, vol. xx., p. 803.

the form described by Stimpson as *Neera pellucida* is quite distinct from that described by Loven as *N. obesa*, with which it has been so long confounded."*

Family Myidae.

MYA ARENARIA, L.

Common almost everywhere in the Maritime Provinces and Gulf of St. Lawrence, the known geographical range of the species on the western side of the Atlantic being from South Carolina to the Arctic Ocean. Adult shells are usually found living at or near low-water mark, but young specimens, as Professor Verrill observes, are occasionally dredged in as deep water as 40 fathoms. Sir J. W. Dawson says that he has a specimen five inches long from Gaspé.

The shell, which is circumpolar, occurs fossil in the Red Crag and later formations of Great Britain; in the Miocene of Virginia; in the Leda clay and lower part of the Saxicava sand, of Maine, New Brunswick, Quebec and eastern Ontario; and in the Pleistocene of Greenland and Europe.

MYA TRUNCATA, L.

Widely distributed on both sides of the north Atlantic and known to range from Cape Cod to the Arctic Ocean, but not nearly so common as *M. arenaria* in the Gulf of St. Lawrence, and usually found in deeper water. On the Le Have Bank, near Cape Sable, N.S., specimens of it were dredged in 45 fathoms, by the U. S. Fish Commission in 1872 (Smith and Harger). The comparatively long and typical form of *M. truncata* seems to be the more common of the two in the lower St. Lawrence and southward, and the short and abruptly truncated form, the var. *Uddevallensis*, northward. Packard dredged specimens of the latter near Caribou Island in 1861; and in 30 fathoms, abundantly, off Square Island, Labrador, in 1864. All the specimens of *M. truncata* collected by Bell at Ashe Inlet and Port Burwell in 1884 are referable to the var. *Uddevallensis*. In Greenland both *M. arenaria* and *M. truncata* are said to be common at low-water and are eaten (as is also *Mytilus edulis*) by the walrus, Arctic fox, Esquimaux dog, raven, and eider.

The species has been recorded by Sir J. W. Dawson as having been collected in the Saxicava sand and Leda clay, at Portland, Maine; New Brunswick; New Richmond, Anticosti, Rivière du Loup, Rivière des Outardes, Quebec, and Montreal, P.Q.; and Labrador; also in the Pleistocene deposits of Greenland and northern Europe. In eastern Canada it is much more abundant as a post-tertiary fossil than as a recent shell.

* Proceedings of the U. S. National Museum, vol. xx., p. 804.

SAXICAVA RUGOSA (L.).

Mya arctica, L. (1767). Syst. Nat., ed. XII., vol. I., pt. 2, p. 1113.

Solen minutus, L. (1767). Op. cit., p. 1115.

Mytilus rugosus, L. (1767). Op. cit., p. 1156.

Mytilus pholadis, L. (1771).

Mya arctica, O. Fabricius (1780).

Mya byssifera, O. Fabricius (1780).

Saxicava rugosa, Lamarck (1818); et auct.

? *Saxicava distorta*, Say (1822).

Both Verrill and Dall include *S. rugosa* among the synonyms of *S. arctica*, and it now seems to be generally conceded that there is but one species of *Saxicava* in the north Atlantic and Pacific. The name *Mya arctica* seems to have been given by Linnaeus to young or half-grown shells, or specimens of a small variety, with well defined lunule and posterior area, the latter usually marked with two spinose longitudinal ridges in each valve; and that of *Mytilus rugosus* to large, adult individuals of the same species, with the lunule and posterior area obsolete. As the Rev. G. W. Taylor has said:—"arctica is the earliest specific name for this shell, but it was applied by Linné to a variety, while the name *rugosus* was given to the typical rock-boring form. *Pholadis*, a still later name, was given to another variety". "that has the shell gaping widely in front and to which Jeffreys (Brit. Conch., vol. III., p. 82) restricts the name *pholadis*."*

S. rugosa (including *S. arctica*) is equally common in the north Atlantic and north Pacific. On the western side of the Atlantic it is known to range from Long Island Sound (and perhaps from Georgia and South Carolina) to Greenland and the Arctic Ocean; and, in depth, from low-water mark to 50 fathoms or more. Shells of this species, as stated by Dall, are found "burrowing, or nestling in gravel or broken shells, or perforating rocks, corallines, or dead shells, like pholads," and often with them. When not boring they are attached by a byssus, and in Casco Bay, in 10 to 15 fathoms, Verrill says that he has found specimens "perforating recent and sound shells of *Cyprina Islandica*."

The species is widely distributed throughout the whole of the region now under consideration, except perhaps in the very deepest parts of the Gulf of St. Lawrence, where the bottom does not seem to suit it, and northward to the Atlantic coast of Labrador, Hudson Strait and Bay. In Hudson Strait, living specimens have been dredged at Ashe Inlet by Bell in 1884; and between King George Sound and the bottom of Ungava Bay by Low in 1897. On the west coast of Hudson Bay similar specimens have been dredged twenty miles off Fort Churchill, in 30 fathoms, by Commander Wakeham in 1897; and on the east coast of Hudson Bay, by Mr. Low, near the mouth of Povungnituk River in 1898; and in Richmond Gulf, in 1899.

* Transactions of the Royal Society of Canada for 1895, Second Series, vol. I., sect. IV.
p. 53.

As a fossil, *S. rugosa* is exceedingly abundant in the Pleistocene deposits of Maine, New Brunswick, and the valleys of the St. Lawrence and Ottawa rivers. It has also been found in similar deposits at a few localities in Ungava, northern Ontario, Keewatin, and on Vancouver Island. At Ungava, it has been collected by Bell on the east coast of Hudson Bay, two or three miles up Little Whale River, in 1877; and in northern Ontario, at Mill Point, near Moose Factory, James Bay, in 1875. In Keewatin it has been collected at the Limestone Rapids of the Fawn Branch of the Severn River, by Mr. Low, in 1886; and at Gluttony Bay, Baker Lake, at the head of Chesterfield Inlet, by Mr. D. T. Hanbury in 1900.

S. rugosa, also, is said to occur in the Miocene, Pliocene and Pleistocene of Europe, and, according to Sir J. W. Dawson, it is "relatively much more abundant in the drift deposits" of the provinces of Quebec and Ontario, 'than in the Gulf of St. Lawrence at present.'

CYRTODARIA SILIQUA, Daudin.

Mya siliqua, Chemnitz (1795).

Glycymeris siliqua, Lamarck (1819); and Gould (1870).

Fishing banks off Halifax, common (Willis); Halifax Harbour and Sable Island beach, dead specimens (J. M. Jones); Bradelle Bank,—and in stomach of cod caught on the Miscou Bank (near the mouth of the Baie des Chaleurs) one fresh and perfect specimen with the animal (Whiteaves); Gaspé Bay, in stomachs of cod (Sir J. W. Dawson); Rimouski and Marsouin (Bell); and near Caribou Island, in from 15 to 50 fathoms, mostly on hard bottoms (Packard).

PANOPEA (PANOMYA) NORVEGICA, Spengler.

Mya Norvegica, Spengler (1793).

Glycymeris arctica, Lamarck (1819); and Gould (1841).

Panomya norvegica, Dall (1898).

Grand Manan, "taken (dead) in forty fathoms on the Hake Ground" (Stimpson); "dredged by me in Bedford Basin, Halifax, but all dead specimens" (Willis); Bradelle Bank,—and Gaspé Bay, in 50 fathoms mud, six dead but fresh specimens (Whiteaves); Little Métis (Sir J. W. Dawson). Living specimens of this mollusc are very rarely brought up in the dredge, owing to the long siphons of the animal and consequent depth of its burrow.

In the Pleistocene of Canada it is said to be "very rare, a few valves only having been found at Rivière du Loup."

Family *Pholadidae*.

ZIRFÆA CRISPATA, L.

Mya crispata, L. (1758).*Pholas crispata*, L. (1767).*Zirfæa crispata*, Gray (1851).*Zirphæa crispata* (Gray) Leach (1852); and of subsequent authors.

Widely distributed throughout the north Atlantic, but rare in the Gulf of St. Lawrence and seas of the Maritime Provinces. So far as known, its bathymetrical range, on the North American side of the Atlantic, is from low-water mark to 70 fathoms. Stimpson says that it occurs very rarely at Grand Manan, and Verrill that he has dredged it in the Bay of Fundy, in 8 to 70 fathoms, hard clay. Willis states that he has received large specimens from Sable Island; the writer has dredged it on the Orphan Bank; and Bell records it as occurring at Bic, Rimouski, and near the Trent.

Dall says that "the *Zirfæa* from the north-west coast of America, referred by Carpenter to *Z. crispata*, is a distinct though allied species, called *Z. Gabbi* by Tryon, and found fossil in the Pleistocene of California, as well as living, there and northward." *

XYLOPHAGA DORSALIS, Turton.

In waterlogged wood, Gaspé Bay, dredged by Sir J. W. Dawson in 1869, and identified with this species by the writer in 1872.

Family *Teredinidae*.

TEREDO NAVALIS, L.

Marine slip timbers at Pictou, N.S.; St. John, N.B., in part of a ship's hull (Whiteaves).

TEREDO DILATATA, Stimpson.

"Very large specimens have been received from Sable Island taken from wreck timber" (Willis). The species is said to be very closely allied to *T. megotara*, Hanley.

* Transactions of the Wagner Free Institute of Science of Philadelphia, vol. III., p. 818.

SCAPHOPODA.

Family *Dentaliidae*.

DENTALIUM ENTALIS, L.

Dentalium entalis (L.) Mighels (1843).*Entalis striolata*, Stimpson (1851).*Dentalium entalis* (L.) Pilsbry (1897).

Grand Manan, "very common on muddy bottoms in the coralline zone" (Stimpson). Passamaquoddy Bay and abundant almost everywhere on muddy bottoms on the southern coast of New Brunswick (Ganong); Annapolis Basin, two examples (Verkruzen). Le Have Bank, Nova Scotia, 45 fathoms gravelly and stony bottom,—and 60 fathoms, coarse gravel, stones and sponges, abundant,—U. S. Fish Commission, 1872 (Smith and Harger).

"*D. entalis* is an abundant species on the coast of Maine; and William Stimpson, comparing with the European *D. vulgare* and finding differences, distinguished the American shells as *D. striolatum*, under which name the species is generally known in American collections. Had he compared with *D. entalis*, the identity of the two would no doubt have been recognized. There is no difference, not even varietal, between English and Maine specimens. *D. striolatum*, or *Entalis striolata* of Jeffreys, Sars and Watson, is *D. occidentale*, Stimpson" (Pilsbry).*

DENTALIUM AGILE, M. Sars.

Between Halifax and Le Have Bank, U. S. Fish Commission (Pilsbry).

DENTALIUM OCCIDENTALE, Stimpson.

Dentalium dentalis, Gould (1841).*Dentalium occidentale*, Stimpson (1851).*Dentalium abyssorum*, M. Sars (1858);*Dentalium dentale*, Gould (1870).

Living specimens of this shell were dredged by the writer in 1871, 1872 and 1873 in the deep-sea mud (150–313 fathoms) at several localities in the Gulf of St. Lawrence, to the north and more especially to the south and south-east of the Island of Anticosti. Writing in 1881, Prof. Verrill says that it is "abundant on muddy bottoms, in 50 to 300 fathoms, all along the coast of New England and Nova Scotia."

* Manual of Conchology, vol. xvii., pp. 43–44.

Family *Siphonodentaliidae*.

SIPHONODENTALIUM LOBATUM (Sowerby).

Dentalium vitreum, M. Sars (1851); not *D. vitreum*, Gmelin.

• *Siphonodentalium vitreum*, M. Sars (1859).

Dentalium lobatum, G. B. Sowerby, jun. (1860).

Dredged by the writer in 1871-73, in deep water at many localities in the Gulf of St. Lawrence north of the Baie des Chaleurs, associated with the preceding species. Sir. J. W. Dawson has found fossil specimens of it in the Leda clay of Murray Bay.

SIPHONODENTALIUM AFFINE, M. Sars.

"A specimen smaller and more slender than the preceding species and which I refer to *S. affine*, was dredged by" our party in the SS. Speedwell of the U. S. Fish Commission "in 1877, in Bedford Basin, near Halifax, Nova Scotia, in 35 fathoms, soft mud" (Verrill; Proc. U. S. Nat. Mus., vol. III., p. 395).

GASTEROPODA.

APLACOPHORA.

Family *Chaetodermatidae*.

CHAETODERMA NITIDULUM, Loven.

Passamaquoddy Bay, 30 fathoms (1872); and common in 10-100 fathoms, muddy bottom, off southern New England and Nova Scotia (Verrill).

POLYPLACOPHORA.

Family *Lepidopleuridae*.

LEPIDOPLEURUS CANCELLATUS (Sowerby).

Chiton cancellatus, Sowerby (1839); et auct.

Leptochiton cancellatus, H. and A. Adams (1854); and Dall (1878).

Lepidopleurus cancellatus, G. O. Sars (1878).

Off Halifax, Nova Scotia, in 95 fathoms, U. S. Fish Commission, 1877; an immature specimen identified by Dall as probably of this species.

LEPIDOPLEURUS ALVEOLUS, M. Sars.

Chiton alveolus (M. Sars, M.S.) Loven (1846).

Lepidopleurus alveolus, G. O. Sars (1878).

Leptochiton alveolus, Dall (1878).

"Gulf of St. Lawrence, in 220 fathoms, between Cap des Rosiers and the S.W. point of Anticosti Island, Whiteaves" (Dall). One specimen.

HANLEYIA MENDICARIA (Mighels and Adams).

Chiton mendicarius, Mighels and Adams (1842).

Hanleyia mendicaria, Dall (1878).

Grand Manan, "35 fathoms in the Hake Bay, a few fine specimens of this rare species" (Stimpson). Le Have Bank, Nova Scotia, 60 fathoms, coarse gravel, sand and sponges, U. S. Fish Commission, 1872 (Smith and Harger).

Family *Ischnochitonidae*.

TONICELLA MARMOREA (Fabricius).

Chiton marmoreus, O. Fabricius (1780).

Chiton fulminatus, Couthouy (1838).

Tonicella marmorea, Carpenter (1873); and Dall (1878).

Common in the Bay of Fundy, on the coast of Nova Scotia, and in the Gulf of St. Lawrence northward to Greenland, living on stones, shells, nullipores, &c., from low-water to fifty fathoms. In June, 1899, Mr. Low collected a small specimen of this species in Richmond Gulf, Hudson Bay.

TRACHYDERMON ALBUS (L.).

Chiton albus, L. (1766); O. Fabricius (1780); et auct.

Trachydermon albus, Carpenter (1873); and Dall (1878).

Ischnochiton (Trachydermon) albus, Pilsbry (1892).

The geographical and bathymetrical distribution of this species is essentially similar to that of the preceding.

TRACHYDERMON RUBER (L.).

Chiton ruber, L. (1766); et auct.

Chiton cinereus, O. Fabricius (1780); non L., nec auct.

Trachydermon ruber, Carpenter (1873).

Ischnochiton ruber, Pilsbry (1892).

Grand Manan, "excessively abundant just below low-water mark, on rocky bottoms, especially on the various species of *Nullipora*" (Stimpson).

~~"Very common in Casco Bay and Bay of Fundy from low-water mark to 40~~

fathoms" (Verrill). Pendleton's Island, south-east side of Passamaquoddy Bay, N.B. (Ganong). Halifax Harbour (J. M. Jones). Not yet reported as occurring in the Gulf of St. Lawrence, though if Möller, Dall and other writers are correct in assuming that the *Chiton cinereus* of O. Fabricius is this species, it has been found also in Greenland.

Family *Acanthochitidae*.

AMICULA VESTITA (Broderip and Sowerby).

Chiton vestitus, Broderip and Sowerby (1829); et auct.

Chiton Emersonii, Couthouy (1838).

Amicula vestita, Gray (1847); et auct.

Amicula Emersonii, Gray (1847); et auct.

Stimpsoniclla Emersonii, Carpenter (1873).

Widely distributed but apparently very local. Willis says that it is common at Bedford Basin, Halifax; and the writer found it to be both large and abundant on the Orphan Bank. Sir J. W. Dawson has dredged it in Gaspé Bay, at Little Métis, Rivière du Loup and Murray Bay; and Mr. Low found one small specimen of it on the beach at Woody Point, between Sandwich Bay and Hamilton Inlet, on the Atlantic coast of Labrador.

PROSOBRANCHIATA.

DOCOGLOSSA.

Family *Lepetidae*.

LEPETA CÆCA (O. F. Müller).

Patella cæca, O. F. Müller (1766).

Patella candida, Couthouy (1838).

Patella cerea, Möller (1842).

Lepeta cæca, Gray (1847); et auct.

"Not unfrequent at Grand Manan, in the coralline zone" (Stimpson); fishing banks off Halifax, Willis; Marsouin, (Bell); Gaspé Bay, from stomach of cod (Sir J. W. Dawson); Gaspé Bay, off Grand Grève, in 20 to 50 fathoms (Whiteaves); Greenland (Möller).

Shells of this little limpet have been found fossil in the Pleistocene of Rivière du Loup, Quebec, Montreal, Labrador and Europe.

ACMÆA TESTUDINALIS (Müller).

Patella testudinalis, Müller (1776).

Lottia testudinalis, Gould (1841).

Acmaea testudinalis, Forbes and Hanley.

Tectura testudinalis, Gould (1870).

Frequent almost everywhere at or near low-water mark, on stones, &c. Packard has dredged young shells in 15 fathoms off Caribou Island. — On the

north American coast the species has long been known to range from Long Island Sound to Greenland. It is common in Norway and Scotland, and on the coast of British Columbia passes imperceptibly into *A. patina*, Eschscholtz.

Specimens of the var. *alveus* (a narrow variety, formed, as Dall says, by the "residence of the individual on a narrow frond of sea weed or *Zostera*") have been found by the writer at low-water in Shediac Bay.

ACMÆA RUBELLA (Fabricius).

Patella rubella, O. Fabricius (1780).

Pilidium rubellum, Packard (1866).

Tectura rubella, G. O. Sars (1878).

Acmaea rubella, Dall (1878).

Fishing banks off Halifax, very rare (Willis). Atlantic coast of Labrador, off Square Island, in 35 fathoms on a hard bottom, also near Strawberry Harbour, on the south-side of Thomas Bay, in 20 fathoms (Packard); and Temple Bay, one living specimen, on a rocky bottom, Stearns expedition (Miss Bush). Greenland, (Fabricius, and Möller).

RHIPIDOGLOSSA.

Family *Fissurellidæ*.

PUNCTURELLA NOACHINA (L).

Patella Noachina, L. (1771); and O. Fabricius.

Puncturella Noachina, Lowe (1827).

Diadora Noachina, Stimpson (1851).

Cenoria Noachina, Gould (1841 and 1870).

Grand Manan. "During a low spring tide in August" (1852) "I obtained a large number of this species from the under surface of large stones, near low-water mark. It has been hitherto found, both here and in Europe, only in deep water" (Stimpson). Willis records it as having been obtained from the fishing banks off Nova Scotia, and as having been dredged in Halifax Harbour in 10 fathoms. It has been dredged at many localities in the Gulf and mouth of the River St. Lawrence, at moderate depths, by Sir J. W. Dawson, Bell, and the writer; also at the Strait of Belle Isle, in 10 to 50 fathoms, by Packard. On the Atlantic coast of Labrador it has been taken off Square Island, in 30 fathoms, by Packard; and Miss Bush records it as having been collected at Henley Harbour, and Dead Island, near Square Island, by the Stearns expedition. If it be the same as the *P. cucullata*, Gould, as named by Pilsbry, it is found also on the coast of British Columbia.

Sir J. W. Dawson says that *P. Noachina* has been found fossil at Rivière du Loup, Quebec; and on the Clyde, Scotland.

Family *Scissurellidæ*.*SCISSURELLA CRISPATA*, Fleming.

Off Caribou Island, P.Q., 1860 (Packard); detected (with *Molleria costulata*) by Sir J. W. Dawson in sand examined for foraminifera. The *Scissurella* is now known to range from New England to Greenland in from 4-790 fathoms, but the writer has never seen a specimen of it from the western side of the Atlantic.

Family *Trochidæ*.*MOLLERIA COSTULATA* (Möller).

Margarita costulata, Möller (1842).

Adeorbis costulata, Stimpson (1851).

Molleria costulata, Jeffreys (1865).

Grand Manan, off Nantucket Island, 4 fathoms, coarse sand, dead specimens, and in deep water off Cape Ann (Stimpson). Gaspé Bay (Whitaves); Marsouin (Bell); Mingan (J. Richardson, jun.); near Caribou Island (Packard).

"Fossil—Montreal; Clyde beds; Uddevalla" (Sir J. W. Dawson.)

MARGARITA HELICINA (Fabricius).

Turbo helicinus, O. Fabricius (1780).

Margarita arctica, Leach (1819); and Gould (1841).

Margarita helicina, Möller (1842); et auct.

Margarita campanulata, Morse (1866).

Grand Manan, "common on the marine plants which cover the rocks above low-water mark. It is particularly abundant on the Long Island shore" (Stimpson); Annapolis Basin, N.S., "moderately abundant" (Verkruzen). "Halifax Harbour, common" (Willis). River and Gulf of St. Lawrence, near low-water mark, at many localities, where it has been collected by Sir J. W. Dawson, Bell, Verrill, the writer and others. In Hudson Strait it has been collected at Ashe Inlet by J. W. Tyrrell in 1885; off Nottingham Island (dredged clinging to kelp and of large size) by J. McKenzie in 1886; and between King George Sound and the bottom of Ungava Bay by A. P. Low, in the SS. Diana, in 1897.

"Fossil—Murray Bay; Montreal" (Sir J. W. Dawson).

MARGARITA UMBILICALIS, Broderip and Sowerby.

A few fine living specimens of this arctic shell have been dredged at Ashe Inlet and Port Burwell, by Dr. R. Bell in 1884 and J. W. Tyrrell in 1885; also off Nottingham Island, Hudson Strait, by J. McKenzie in 1886. The specimens from Port Burwell referred to on page 60DD of the Report of Progress of this Survey for 1882-83-84, as very large individuals of *M. helicina*, have since been identified with this species by the writer.

Dall says that two specimens of *M. umbilicalis* were taken from the stomach of a codfish, caught in Nachvak Bay or Inlet (Ungava) by L. M. Turner in 1883. "The locality is about 90 miles south of Hudson Strait." "This well distinguished species" (Dall adds) "is more northern in its southern limits than *M. helicina*, and has been taken at Point Barrow, Cumberland Inlet, Melville Peninsula, and East Greenland; the latter locality from specimens sent by the second German Polar expedition and catalogued in their report as *Trochus helycinus*."*

MARGARITA OLIVACEA (Brown).

Turbo olivaceus, Brown (1827 and 1844).

Margarita argentata, Gould (1841 and 1870).

Margarita glauca, Möller (1842).

Grand Manan, "taken alive in four fathoms, coarse sand, off Duck Island boat moorings" (Stimpson). A few living specimens were dredged by the writer off Grande Grève, Gaspé Bay, in 20-50 fathoms, in 1869; on the north shore of the Gulf of St. Lawrence, off Sawhill Point, in 30 fathoms sand, and off the St. John River, near the West Point of Anticosti, in 60 fathoms sand, in 1871. Little Métis, Rivière du Loup and Murray Bay (Sir J. W. Dawson).

"Fossil—Montreal, rare" (Sir J. W. Dawson).

MARGARITA ACUMINATA (Sowerby?) Mighels and Adams.

Margarita acuminata? Sowerby (1838).

Margarita acuminata, Mighels and Adams (1842).

"Gulf of St. Lawrence, taken from the stomach of a codfish, by Mr. Foster, in the summer of 1841. Only a single specimen was found, which is in the cabinet of J. W. Mighels." Grand Manan, "in 40 fathoms on a soft muddy bottom off the Swallow's Tail" (Stimpson). Not found of late years by any collectors in the Bay of Fundy or Gulf of St. Lawrence. "Arctic Ocean" (Pilsbry).

* Proceedings of the U. S. National Museum, vol. ix., (1886), p. 206.

MARGARITA UNDULATA, Sowerby.

Trochus Grœnlandicus umbilicatus, &c., Chemnitz (1781); but not binomial.

Trochus cinerarius, O. Fabricius (1780); non L. (1766).

Margarita striata, Leach (1819).

Margarita undulata, Sowerby (1838); et auct.

• *Turbo incarnatus*, Couthouy (1838-39).

Margarita grœnlandica, G. O. Sars (1878).

Grand Manan, "on weedy, rocky and multipore bottoms, in shallow water" (Stimpson); L'Etang Harbour and Passamaquoddy Bay (Ganong); Annapolis Basin (Verkrûzen). Fishing banks off Halifax (Willis); Le Have Bank, Nova Scotia, in 45 fathoms, gravelly and stony bottom, U. S. Fish Commission, 1872 (Smith and Harger). Gulf of St. Lawrence, at Gaspé Bay, in 30 to 50 fathoms, and at several other localities (Whiteaves); St. Anne and Ruisseau Vallée (Bell); near Caribou Island, "common in 15-20 fathoms, sand" (Packard). Atlantic coast of Labrador, between Sandwich Bay and Hamilton Inlet, dead but perfect shells on the beach (A. P. Low, 1894).

The name of this species is not included in Sir J. W. Dawson's list of Pleistocene fossils in the "Canadian Ice Age."

MARGARITA CINEREA (Couthouy); and var. GRANDIS.

Margarita striata, Broderip and Sowerby (1829); non Leach (1819), which, however, is said to be the same as *M. undulata*, Sowerby.

Turbo cinereus, Couthouy (1838-39).

Margarita cinerea, Gould (1841); et auct.

Margarita cinerea, var. *grandis* (Mörch) G. O. Sars (1878).

Bay of Fundy (Stimpson, and Verrill); Passamaquoddy Bay (Ganong); Annapolis Basin (Verkrûzen); Atlantic coast of Nova Scotia (Willis,—and Smith and Harger). Gulf and mouth of the River St. Lawrence at many localities, dredged by Sir J. W. Dawson, Bell, Packard, and the writer; Atlantic coast of Labrador (Packard, and A. P. Low); Hudson Strait (Bell); and Greenland (Möller); from low-water mark to 100 fathoms, but apparently most abundant in from about 10 to 60 fathoms. Specimens from the Gulf of St. Lawrence and Labrador coast, average about 16 mm. in their basal diameter, and 18 mm. in height.

Fossil at Portland, and Rivière du Loup (Sir J. W. Dawson).

SOLARIELLA OBSCURA (Couthouy).

Turbo obscurus, Couthouy (1838-39).

Margarita obscura, Gould (1841); et auct.

Machæoplax obscura, G. O. Sars (1878).

Solariella obscura, Pilsbry (1889).

With the preceding, but not yet recorded as having been collected in Greenland.

SOLARIELLA OBSCURA, var. BELLA, Verkruzen.

Margarita bella, Verkruzen (1875); no description.

Machæroplax bella, Friele (1876); and G. O. Sars (1878).

Machæroplax obscura, var. *bella*, Verrill (1882).

Solariella obscura, var. *bella*, Pilsbry (1889).

Annapolis Basin (Verkruzen); off Cape Sable, Nova Scotia, in 90 fathoms, U. S. Fish Commission, 1877 (Verrill). The "variety *bella* is the predominant form at Eastport, Maine, and in the Bay of Fundy, where I dredged it in 1864, 1865, 1868, 1870, in 10 to 40 fathoms." "It differs from the typical form chiefly in having the base covered with distinct, incised, spiral lines" * (Verrill). The types of *M. bella* are from Magero, an island in the Arctic Ocean, to the extreme north of Norway.

SOLARIELLA VARICOSA (Mighels and Adams).

Margarita varicosa, Mighels and Adams (1842); et auct.

Machæroplax varicosa, G. O. Sars (1878).

Solariella varicosa, Pilsbry (1889).

Apparently more local than the two preceding species, but generally abundant where found. According to Willis, this shell has been taken on the fishing banks off Halifax; and in 1872 Messrs. Smitt and Harger dredged it "off Chebucto Head, Halifax, in 20 fathoms soft mud and fine sand with decaying seaweed." The writer dredged it abundantly (in 1867 and 1869) off Grande Grève, Gaspé Bay, in 30-50 fathoms mud; also (in 1871) on the north shore of the Gulf of St. Lawrence, off Sawhill Point, in 30 fathoms sand,—and off St. John River (near the West Point of Anticosti), in 60 fathoms sand. In the Strait of Belle Isle and on the Labrador coast it has been collected at several localities, in from 1-50 fathoms, by Packard in 1864 and by the Stearns expedition in 1882. G. O. Sars' figures of the shell of this species give a much better idea of its minute characters, than the corresponding woodcut on page 285 of the second edition of Gould's "Invertebrata of Massachusetts."

CALLIOSTOMA OCCIDENTALE (Mighels and Adams).

Trochus occidentalis, Mighels and Adams (1841).

Margarita alabastrum, Beck (1846).

Calliostoma occidentalis, Pilsbry (1889).

Grand Manan, in 25 to 40 fathoms in the Hake Bay. "The specimens were very large and beautiful, especially when alive." The animal has four lateral cirrhi, thus differing from other Trochi, which have three; and from *Margarita*, which has five" (Stimpson).

* 1882. Transactions of the Connecticut Academy of Arts and Sciences, vol. v., p. 531.

GYMNOGLOSSA.

Family *Pyramidellidae*.

TURBONILLA NIVEA, Stimpson.

Chemnitzia nivea, Stimpson (1851).*Turbonilla nivea*, Stimpson (1862).

Off Grand Manan Island, on a muddy and gravelly bottom, in 40 fathoms (Stimpson).

TURBONILLA INTERRUPTA, var. FULVOCINCTA.

Turritella interrupta, Totten (1835).*Melania rufa*, Philippi (1836); fide Dall.*Turbonilla interrupta*, Stimpson (1862).*Odostomia rufa* (Philippi) var. *fulvocincta*, Jeffreys (1884).*Turbonilla rufa*, var. *fulvocincta*, Dall (1889).

Shediac Bay, N.B., in 2 to 10 fathoms, frequent, alive, 1873 (Whiteaves). More or less common on the oyster beds at Cocagne, N.B., and at Summerside, P.E.I.; (Rev. H. W. Winkley, 1887).

"This species is, as claimed by Jeffreys, identical with Philippi's *rufa*. "The specimens pass through the same series of varieties." The form reported under this name from Shediac by Whiteaves is remarkably distinct, taken by itself, but I suspect a connecting series could be obtained" (Dall, 1889).*

ODOSTOMIA TRIFIDA (Totten).

Acteon trifidus, Totten (1834).*Odostomia trifida*, Gould (1841); et auct. Am.

Pointe du Chêne, Shediac Bay, at low-water, one specimen, collected by the writer in 1873; abundant at Cocagne and Bedeque (Rev. H. W. Winkley, 1887).

ODOSTOMIA SEMINUDA (Adams).

Jaminia seminuda, C. B. Adams (1830).*Odostomia seminuda*, Gould (1841); et auct.*Chemnitzia seminuda*, Stimpson (1851).*Turbonilla seminuda*, H. and A. Adams (1858).

Abundant on the oyster beds at Summerside, P.E.I (Rev. H. W. Winkley, 1887).

* Bulletin of the Museum of Comparative Zoology, vol. xviii. p. 336.

ODOSTOMIA FUSCA (Adams).

Pyramis fusca, C. B. Adams (1839).

Odostomia fusca, Gould (1841 and 1870); et auct.

Rare on the oyster beds at Bedeque (Rev. H. W. Winkley, 1887).

ODOSTOMIA BISUTURALIS (Say).

Turritella bisuturalis, Say (1822).

Jamnia exigua, Couthouy (1838).

Odostomia exigua, Gould (1841).

Chemnitzia bisuturalis, Stimpson (1851).

From the mud of oyster barrels which came from the Gulf of St. Lawrence (Ganong, 1891). In the "Nautilus" for March, 1901, however, the Rev. H. W. Winkley expresses the opinion that *O. trifida*, *O. bisuturalis* and *O. impressa* will probably have to be united under one name.

MENESTHO ALBULA (Fabricius).

Turbo albulus, O. Fabricius (1780).

Menestho albula, Möller (1842).

The young (probably of this species) were frequent in 2-15 fathoms, sand, off Caribou Island (Packard). "One young, living, at L'Anse au Loup" (Strait of Belle Isle) "10 fathoms, mud and kelp. This specimen does not agree precisely with Greenland examples" (Miss Bush, in Catalogue of the Mollusca, etc., obtained by the Stearns Labrador expedition in 1882).

Dr. Paul Fischer regards *Menestho* (Möller) and *Liostomia* (G. O. Sars) as only subgenera of *Eulimella* (Forbes), and this view is adopted by Tryon in the eighth volume of his Manual of Conchology. Verrill, however, thinks that *Liostomia* is a synonym of *Menestho*.

MENESTHO STRIATULA (Couthouy).

Pyramis striatula, Couthouy (1838).

Menestho albula, Gould (1870); non Möller.

Odostomia striatula, Verrill (1880).

Grand Manan Island, "in the laminarian and coralline zones" (Stimpson); Bay of Fundy (Verrill); fishing banks off Halifax, rare (Willis); off Grande Grève, Gaspé Bay, on stones, in about 20 fathoms, three living adult specimens, dredged by the writer in 1867.

LIOSTOMIA EBURNEA (Stimpson).

Rissoa eburnea, Stimpson (1851).

Rissoella eburnea, Stimpson (1862).

Liostomia eburnea, G. O. Sars (1878).

Grand Manan Island, in 25 fathoms, shelly bottom (Stimpson); north shore of the Gulf of St. Lawrence, off Moisie village, in 70 fathoms, one living adult specimen, dredged by the writer in 1871.

Family Eulimidae.

EULIMA STENOSTOMA, Jeffreys.

Gulf of St. Lawrence, dredged by the writer in 1871 at Ellis Bay, Anticosti, bearing S.W., 21 miles distant, in 160 fathoms, mud, one living specimen; and in 1872, thirty miles N.E. of Cap des Rosiers, in 200 fathoms, mud, one dead but perfect specimen.

PTENOGLOSSA.

Family Scalariidae.

SCALARIA GRÆNLANDICA, Perry.

Scalaria Grænlandica, Perry (1811); teste Mörch.

Scalaria subulata, Couthouy (1838).

Grand Manan Island, "on pebbly and shelly bottoms in 10 to 60 fathoms" (Stimpson); "common in Casco Bay and Bay of Fundy, from 10-109 fathoms" (Verrill); Annapolis Basin (Verkruzen). Fishing banks off Halifax, scarce (Willis); Le Have Bank, N.S., 45 fathoms, gravelly and stony bottom, abundant (Smith and Harger). Gulf and mouth of the River St. Lawrence, at St. George's Cove, Gaspé Bay, rare (Whiteaves); at Rivière du Loup and Kamouraska (Sir J. W. Dawson); and near Caribou Island, "only a fragment of a specimen" (Packard).

Fossil at Saco, Maine, at Rivière du Loup and Quebec, also in the English Red Crag and Scottish Pleistocene.

SCALARIA (ACIRSA) COSTULATA (Mighels).

Turritella costulata, Mighels (1841).

Scalaria borealis, Beck (1839); "probably, not described."

Scalaria Eschrichtii, (Holböll) Möller (1842).

Scalaria undulata, Sowerby (1847).

Off Grand Manan Island, "in deep water, rare" (Stimpson); Bay of Fundy (Verrill). Little Métis and Murray Bay (Sir J. W. Dawson).

Fossil at Rivière du Loup, Beauport and Montreal, but most abundant at Rivière du Loup (Sir J. W. Dawson).

Family *Ianthinidae*.

IANTHINA FRAGILIS, Lamarck.

"Only a fragment found at Sable Island to identify by; probably a drift shell" (Willis). According to Verrill, *I. fragilis* has been "found cast ashore at Nantucket, but probably does not occur living so far north. It inhabits the Gulf Stream farther south." *

TENIOGLOSSA.

Family *Naticidae*.

AMAURA CANDIDA, Möller.

1842. Index Molluscorum Grœnlandiæ, p. 7.

One living specimen of this shell was dredged by the writer in 1869, off Grande Grève, Gaspé Bay, in from about 20 or 30 to 50 fathoms.

AMAUROPSIS ISLANDICA (Gmelin).

Nerita Islandica, Gmelin (1792).

Natica helicoides, Johnston (1835).

Natica canaliculata, Gould (1840).

Natica cornea, Möller (1842).

Amauropsis helicoides, Stimpson (1862).

Amauropsis Islandica (Gmelin) G. O. Sars (1878).

Sable Island, fishing banks (Willis); Marsouin (Dr. R. Bell). Very rare in good condition.

Specimens from the Pleistocene deposits at Montreal that were at first identified with this species, are the types of the since described *Choristes elegans*, Carpenter.

ACRYBIA FLAVA (Gould).

Natica flava, Gould (1840).

Natica Smithii, Brown (1844).

Bulbus flavus, Stimpson (1862).

Grand Manan, "taken in 50 fathoms, mud, some miles off the Swallow's Tail" (Stimpson); Sable Island and fishing banks off Halifax (Willis). Rimouski, Les Islets and Claude (Bell). Also rare, in good condition.

* U.S. Fish Commission, Report for 1871-72 (1873), p. 660.

LUNATIA IMMACULATA (Totten).

Natica immaculata, Totten (1835).*Lunatia immaculata*, H. and A. Adams (1858).*Mamma* (?) *immaculata*, Stimpson (1862).

Grand Manan, "rather common on the sands of Fisher's Cove at low-water, and more rarely occurring at various depths, to 25 fathoms" (Stimpson). Bay of Fundy, 5 to 80 fathoms, common,—and often found at low-water mark in the Bay of Fundy (Verrill). Passamaquoddy Bay, and L'Etang Harbour, N.B. (Ganong); Annapolis Basin (Verkrusen); Sable Island and fishing banks off Halifax (Willis). Dredged by the writer between Cape Bear and Pictou Island, and on the Orphan Bank, in 1873; and off Grande Grève, Gaspé Bay, in 1869.

LUNATIA GRÆNLANDICA (Beck) Möller.

Natica Grænlantica (Beck) Möller (1842).*Lunatia Grænlantica*, Stimpson (1862).

Throughout the entire region, at depths of from 3 to 50 or 60 fathoms, and extending northward to Labrador, Hudson Strait and Greenland. Bell dredged it at Ashe Inlet in 1884, and Low found dead specimens of it on the beach between Hamilton Inlet and Sandwich Bay, Labrador, in 1896.

As a Pleistocene fossil the species has been found in Maine, at Anticosti, Rivière du Loup, Quebec, and Montreal, as well as in England, Scotland and Norway.

LUNATIA NANA (Möller).

Natica nana, Möller (1842).*Lunatia nana*, G. O. Sars (1878).

Le Have Bank, Nova Scotia, in 45 fathoms, U. S. Fish Commission, 1872 (Smith and Harger); Gaspé Bay, 1869 (Whiteaves).

LUNATIA HEROS (Say).

Natica heros, Say (1822); and Gould (1841).*Lunatia heros*, H. and A. Adams (1858); and Gould (1870).

Grand Manan, "in sheltered muddy bays, about low-water mark; rarely found. The specimens were all of the northern, short-spined type, and of a very thin structure, with well-developed epidermis" (Stimpson). Bay of Fundy, common, from low-water to 40 fathoms (Verrill). "Passamaquoddy Bay, L'Etang and Bliss harbours, St. Croix River, and in fact abundant almost everywhere on the Charlotte County coast where there is sand" (Ganong). St. Mary's Bay and Annapolis Basin, N.S. (Verkrusen). Sable

Island, and Nova Scotia sand beaches (Willis). Found also on sandy beaches in Northumberland Strait and at many localities in the River and Gulf of St. Lawrence. The most northerly locality from which this species has been recorded is Salmon Bay, on the north shore of the Gulf, just inside of the Strait of Belle Isle, where two young dead shells were collected at high-water mark by Packard in 1861.

Rare and of small size in the Pleistocene of New Brunswick, and at Beauport, P.Q.

LUNATIA HEROS, var. TRISERIATA (Say).

Natica triseriata, Say (1822).

Lunatia triseriata, Gould (1870).

The distribution and bathymetrical range of the var. *triseriata* are very similar to those of the typical *L. heros*, but the former has not yet been found on the north shore of the River and Gulf of St. Lawrence, nor in the Pleistocene of Canada.

NATICA CLAUSA, Broderip and Sowerby.

Natica clausi, Broderip and Sowerby (1829).

Natica consolidata, Couthouy (1838).

Throughout the entire region, and northward, usually at depths of less than fifty fathoms. Verrill, however, has dredged this circumpolar species in as deep water as 109 fathoms, in the Bay of Fundy; and the writer dredged a living specimen off Cap des Rosiers lighthouse in 110 fathoms, coarse sand, with stones, in 1872.

It has been found fossil at Portland, Maine; at St. John and other localities in New Brunswick; at Anticosti, Rivière du Loup, Quebec and Montreal; also at Vancouver Island, and at many localities in Europe.

Family Lamelliariidae.

VELUTINA LAEVIGATA (Pennant).

Bulla velutina, Müller (1776).

Helix laevigata, Pennant (1777).

Helix haliotoides, O. Fabricius (1780).

Velutina haliotoides, Möller (1842).

Velutina laevigata, G. O. Sars (1878).

Grand Manan, Stimpson, who says that very large specimens of this and the next species are "taken in the laminarian zone," *V. zonata* "inhabiting, however, deeper water than" *V. laevigata*, "which occasionally occurs at low-water."—Annapolis Basin, "seldom" (Verkrusen). Fishing banks off

Halifax, rare (Willis); Gaspé Bay (Whiteaves); St. Anne (Bell); Henley Harbour, Strait of Belle Isle, in 3 to 8 fathoms, and Dead Island, near Square Island, in 1-4 fathoms, Stearns expedition (Miss Bush); Greenland (Fabricius, and Möller).

VELUTINA (LIMNERIA) UNDATA (Brown).

Galericulum undatum, Brown (1827 and 1844).

Velutina zonata, Gould (1841).

Limneria undata, H. and A. Adams (1853).

Morvillia undata, Gray (1857).

Grand Manan (Stimpson); fishing banks off Halifax (Willis); Halifax Harbour (J. M. Jones); Gaspé Bay (Whiteaves); Little Métis and Kamouraska (Sir J. W. Dawson).

"Fossil,—Beauport and Montreal" (Sir J. W. Dawson); Ottawa (Dr. H. M. Ami, 1900).

VELUTELLA CRYPTOSPIRA, Middendorf.

"A good living example of this shell was taken by us on the Speedwell," of the U. S. Fish Commission, "in 1877, off Halifax, Nova Scotia, in 57 fathoms." It had previously been obtained in northern Norway (Sars) and in the north Pacific and Bering's Straits * (Verrill).

MARSENINA GLABRA (Couthouy).

Oxynoe glabra, Couthouy (1838).

Sigaretus haliotoideus, Gould (1841).

Sigaretus? Greenlandicus, Möller (1842).

Lamellaria perspicua, Stimpson (1851); non Loven.

Marsenina Greenlandica, Stimpson (1862).

Grand Manan. "Inhabits rocks in the coralline zone. It is rarely taken by the dredge, however, from its preferring the crevices of the ledges to their upper surfaces" (Stimpson). Fishing banks off Halifax, very rare (Willis); south shore of the St. Lawrence at Ruisseau Vallée (Bell); and off Caribou Island, P.Q., in 15 fathoms, sand and mud (Packard).

Marsenina prodita, Loven, is a Greenland shell which may be expected to occur on the coast of the Maritime Provinces or in the Gulf of St. Lawrence, as it has been dredged at Eastport, Maine.

* 1882. Transactions of the Connecticut Academy of Arts and Sciences, vol. v., p. 519

Family *Capulidae*.

CAPULACMÆA RADIATA, M. Sars.

- Capulus radiatus*, M. Sars (1849).
Pilidium radiatum, M. Sars (1856).
Pilidium commodum, Middendorf (1851).
Capulacmæa radiata, M. Sars.
Piliscus probus, Loven (1859).
Piliscus commodus, Verrill (1885).
Capulus (Capulacmæa) radiata, Tryon (1886).

Off Nova Scotia, in 150 fathoms, U. S. Fish Commission, SS. Albatross dredgings of 1883 (Verrill).

Rare in the Leda clay at Pointe Lévis and Montreal.

CREPIDULA FORNICATA (L.)

- Patella fornicata*, L. (1767).
Crepidula fornicata, Lamarck (1799); et auct.

Abundant on oysters throughout the whole oyster region northward to Caraquette Bay, also, on other shells, etc., in Northumberland Strait. Verrill says that it has not been found in the Bay of Fundy, but G. T. Kennedy has dredged it alive in Minas Basin. Atlantic coast of Nova Scotia, common (Willis). Dead shells of this species were collected by Professor Macoun in 1899 on the beach at Sable Island.

A small specimen of it was found fossil in the Saxicava sand at the Mile End, Montreal, by Baron de Geer in 1891 (Sir J. W. Dawson).

Crepidula glauca, Say, which was included by Willis in his latest list of Nova Scotian shells, was regarded by Dr. Stimpson as a synonym of *C. fornicata*.

CREPIDULA PLANA, Say.

- Crepidula unguiformis*? Lamarck (1822).
Crepidula plana, Say (1822); et auct. Am.
Crepidula unguiformis, Stimpson (1851).

Found also throughout the oyster region; off Sable Island, and in Northumberland Strait. Le Have Bank, Nova Scotia, in 45 fathoms, gravelly and sandy bottom, one alive; U. S. Fish Commission, 1872 (Smith and Harger). Frequently it occurs with *C. fornicata*, on the outside of shells, Limuli, &c." (Verrill).

A difference of opinion exists as to whether the *C. plana* of Say is or is not identical with *C. unguiformis* of Lamarck. In the U. S. Fish Commission Report for 1871-72, p. 650, Verrill says that the Mediterranean shell *C. unguiformis*, Lamarck, is a distinct species. On the other hand, Stimpson, in 1851, identified New England shells with Lamarck's species. Tryon,

also, in the eighth volume of his *Manual of Conchology*, published in 1886 (page 130), writes as follows:—"Some authors have contended that the European *C. unguiformis* is a different species from our *C. plana*; the comparison of large suites of both will demonstrate their identity to any one."

CREPIDULA CONVEXA, Say.

Crepidula convexa, Say (1822); et auct.

Sable Island (Willis). The form of this shell is said to be "due to its attachment on the crustacean *Eupagurus longicarpus* and the gastropod *Ilyanassa obsoleta*" (Tryon).

CRUCIBULUM STRIATUM (Say).

Calyptraea (Dispoten) striata, Say (1836).

Crucibulum (Dispoten) striatum, H. and A. Adams (1858).

Grand Manan (Stimpson); Bay of Fundy, common, low-water mark to 30 fathoms (Verrill); L'Etang Harbour, Charlotte Co., N.B., in 7 to 10 fathoms, very abundant (Ganong); Annapolis Basin, N.S., "not abundant" (Verkrusen).

Family Rissoidæ.

CINGULA MINUTA (Totten).

Turbo minutus, Totten (1834).

Cingula minuta, Gould (1841).

Littorinella minuta, Stimpson (1865).

Rissoa minuta, Gould (1870).

Hydrobia minuta, G. O. Sars (1878).

At or a little below low-water mark, or under stones between tides, throughout the entire region. The species is known to range southward to New Jersey, and northward to Fox Harbour, Lewis Sound, Labrador, where, according to Miss Bush, one dead shell was dredged by the Stearns expedition in 1882.

CINGULA GLOBULUS (Möller).

Rissoa globulus, Möller (1842).

Cingula globulus, Verrill (1879).

One dead specimen of this shell was dredged by the writer in 1872, five miles and a quarter to the E.S.E. of Bonaventure Island, in 60 fathoms, tough, sandy mud.

CINGULA CARINATA, Mighels and Adams.

Cingula semicostata, Mighels and Adams (1842); but not *Turbo semicostatus*, Montagu (1803).

Cingula carinata, Mighels and Adams (1842).

Rissoa pelayica, Stimpson (1851).

Rissoa carinata, Stimpson (1862); and Gould (1870).

Grand Manan Island, "rather common in the coralline zone" (Stimpson). Gaspé Bay; in 200 fathoms, mud, to the south and south-east of the Island of Anticosti; and on the north shore of the Gulf of St. Lawrence, half way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms, small stones and coarse sand, abundant and living (Whiteaves).

CINGULA ARENARIA, Mighels and Adams.

Cingula arenaria, Mighels and Adams (1842).

Rissoa Mighelsi, Stimpson (1851).

Rissoa exarata, Stimpson (1851).

Near Grand Manan Island, "in 25 fathoms off the northern point of Duck Island" (Stimpson); Bay of Fundy, 4 to 20 fathoms (Verrill).

Tryon says that Stimpson changed the name of this shell "to *R. Mighelsi* on account of *Turbo arenarius* (Mtg. ?) Maton, Turton, &c., which, however, is *Odostomia decussata*. *R. exarata*, Stimpson, is a synonym."* The "*Odostomia decussata*" of this passage should read *Rissoina decussata*, as is obvious from the list of synonyms of the latter species given by Tryon in another page (p. 385) of the same volume.

Fossil at Montreal (Sir J. W. Dawson).

CINGULA MULTILINEATA (Stimpson).

Rissoa multilineata, Stimpson (1851).

Cingula multilineata, Verrill (1879).

Halifax, Willis (teste Gould).

CINGULA (ALVANIA) AREOLATA (Stimpson).

Turritella areolata, Stimpson (1851).

Cingula areolata, Verrill (1879).

North shore of the Gulf of St. Lawrence, half way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms, small stones and coarse sand (Whiteaves, 1871, as identified by Verrill).

* Manual of Conchology, vol. ix., p. 347.

CINGULA (ALVANIA) CASTANEA (Möller).

Rissoa castanea, Möller (1842).*Cingula castanea*, G. O. Sars (1878).

Gaspé Bay (Whiteaves); Mingan (J. Richardson); near Caribou Island, in 15 fathoms sand (Packard); Dead Island, near Square Island, Labrador, 1 to 4 fathoms, hard bottom, Stearns expedition (Miss Bush).

Fossil in the Leda clay of Montreal (Sir J. W. Dawson).

CINGULA (ALVANIA) JAN MEYENI (Friele).

Rissoa Jan-Meyeni, Friele (1877).*Cingula Jan-Meyeni*, Verrill (1879).

Some small but adult specimens of this shell were dredged by the writer in 1869 off Grande Grève, in Gaspé Bay, in from 20-50 fathoms; and a few larger ones, in 1871-73, to the north, south-east and south of the Island of Anticosti, in 200 fathoms mud. These were identified with Friele's *R. Jan-Meyeni* by Verrill in 1879, and before that year they had been referred to *Rissoa scrobiculata*, Möller, on the authority of Jeffreys.

A few specimens of this species have been found fossil in the Leda clay of Montreal, by Sir J. W. Dawson.

CINGULA (ONOA) ACULEUS, Gould.

Cingula aculeus, Gould (1841).*Rissoa aculeus*, Stimpson (1851).

Grand Manan Island, "in the littoral zone, rare" (Stimpson); shores of the Bay of Fundy, common (Verrill).

Family *Skeneiidae*.

SKENEIA PLANORBIS (Fabricius).

Turbo planorbis, O. Fabricius (1780).*Skenea planorbis*, Fleming (1828); et auct.*Skenea serpuloides*, Gould (1841).

Nova Scotia (Willis); very common on all rocky shores in Massachusetts Bay, Casco Bay and the Bay of Fundy (Verrill); Greenland (Fabricius).

Family *Litorinidae*.

LITORINA RUDIS (Maton).

Turbo rudis, Maton (1797) teste Jeffreys; and Donovan (1800).

Turbo tenebrosus, Montagu (1803). Variety.

Turbo obligatus, Say (1822).

Turbo vestitus, Say (1822). The var. *tenebrosa*.

Littorina rudis, Gould (1841 and 1870).

Littorina tenebrosa, Gould (1841 and 1870).

Littorina Grœnlandica, Möller (1842).

Abundant almost everywhere on rocks, sea weeds, etc., often above reach of the highest tides, but sometimes washed downward into very deep water. Thus, in 1871, the writer dredged a single living specimen of this shell in 160 fathoms, mud, twenty-one miles S.W. of Ellis Bay, Anticosti. The species has long been known to occur on the coasts of Labrador and Greenland. Mr. Low collected living specimens of it on the shore between King George Sound and the bottom of Ungava Bay, on the south side of Hudson Strait, in 1897; and on the shore of Richmond Gulf, on the east coast of Hudson Bay, in 1899.

As a fossil, *L. rudis* has been collected in the Pleistocene deposits at Rivière du Loup, by Sir J. W. Dawson; also in the Clyde beds and at Uddevalla, in Sweden.

LITORINA PALLIATA (Say).

Turbo littoralis, O. Fabricius (1780).

Turbo palliatus, Say (1822).

Littorina palliata, Gould (1841 and 1870).

Littorina arctica, Möller (1842).

Littorina littoralis, Stimpson (1851).

Throughout the entire region, in similar situations to the preceding species, but a little more local and not quite so common. Jeffreys says that *L. palliata* is a synonym of *L. littoralis*, L., which is not European, the *L. littoralis* of Forbes and Hanley being *L. obtusata*, L. In the second edition of Gould's Invertebrata of Massachusetts, *L. palliata* is said to occur fossil at Beaufort, on the authority of Sir J. W. Dawson, but the name of that species is not included in the list of Pleistocene fossils in the Canadian Ice Age.

LITORINA LITOREA (L.).

Turbo littoreus, L. (1787).

Littorina littorea, Johnston; et auct.

Whole coast of Nova Scotia (Willis) but this probably means only the Atlantic coast. According to Ganong* this species was discovered at Hali-

* American Naturalist for November, 1886.

fax, by Willis, in 1857; but Sir J. W. Dawson, writing in 1871, says, "it occurs abundantly and of large size off different parts of the coast" of Prince Edward Island "as it does also on the opposite shore of Nova Scotia, where I have collected the species more than forty years ago."* Abundant in the waters of the Charlotte County coast, N.B. (Ganong). Souris and Charlottetown, P.E.I., (Whiteaves). Miss Bush includes the name of this species in her list of the Labrador mollusca obtained by the Stearn's expedition in 1882,† and adds that it is "very rare at so northern a latitude."

It is still doubtful whether this is an indigenous species or one introduced from Europe, but the balance of evidence would seem to be in favour of the latter hypothesis.

LACUNA NERITOIDEA, Gould.

Grand Manan Island (Verrill); Greenland (Möller, as *Lacuna pallidula*). If this shell is the same as the *Nerita pallidula* of Da Costa (1778), as stated by Möller, G. O. Sars, and Tryon, it should be called *Lacuna pallidula* (DaCosta).

LACUNA VINCTA (Montagu).

Trochus divaricatus, O. Fabricius (1780); non Linné.

Turbo vinctus, Montagu (1803).

Lacuna vincta, Turton (1827); et auct.

Lacuna divaricata, Loven (1846); et auct.

Grand Manan Island. "The variety common here is strong, broad, pale brown, with one white band under the suture" (Stimpson). Very abundant in the Bay of Fundy (Verrill); Annapolis Basin (Verkrusen). Fishing banks off Halifax, common (Willis); whole coast of Nova Scotia (J. M. Jones). Gaspé Bay, very common on fronds of *Laminaria* (Sir J. W. Dawson) and on sea weeds in shallow water (Whiteaves); Anticosti (Verrill, Whiteaves, and Macoun); whole coast below Rimouski (Bell); Caribou Island, where the "plain and banded varieties were common" (Packard). Square Island, Atlantic coast of Labrador, in 30 fathoms (Packard); common on the north shore of the strait of Belle Isle, at Forteau Bay, 20 fathoms, and at L'Anse au Loup in 8-15 fathoms; also on the Atlantic coast of Labrador, at Fox Harbour, St. Lewis Sound, in 1 to 4 fathoms, and at Dead Island, near Square Island, in 1 to 4 fathoms, Stearns expedition (Miss Bush); Atlantic coast of Labrador, between Sandwich Bay and Hamilton Inlet, 1894, and Davis Inlet, 1896 (Low).

* Report of the Geological Structure and Mineral Resources of Prince Edward Island, p. 50.

† Proceedings of the U. S. National Museum, vol. vi. (1883), p. 240.

LACUNA GLACIALIS, Möller.

One adult living specimen of this Greenland shell was dredged by the writer in 1871 on the north shore of the Gulf or mouth of the River St. Lawrence, half way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms, small stones and coarse sand.

Family *Turritellidae*.

TURRITELLA EROSA, Couthouy.

Turritella erosa, Couthouy (1838).

Turritella polaris (Beck) Möller (1842).

Throughout the whole region, at depths of from 10 to 60 fathoms. Northward the species has long been known to occur on the coast of Labrador and Greenland. More recently it has been dredged in Hudson Strait, at Port Burwell and Ashe Inlet, by Bell; and between King George Sound and the bottom of Ungava Bay, by Low.

As a Pleistocene fossil this shell has been found at Rivière du Loup, Labrador, and perhaps Montreal (Sir J. W. Dawson).

TURRITELLA RETICULATA, Mighels and Adams.

Turritella reticulata, Mighels and Adams (1842).

Turritella lactea, Möller (1842).

Mesalia lacteola, Carpenter (1864).

With the preceding species, on the Atlantic coast of North America, but on the Stearns Labrador exploring expedition, Miss Bush says it was dredged in as shallow water as from 2 to 4, and from 3 to 15 fathoms. It is common also on the coast of British Columbia. The types of *T. reticulata*, are said by its describers to be from the "Bay Chaleur, in the Gulf of St. Lawrence; taken from the stomachs of codfishes by Mr. Foster, fisherman, in the summer of 1841, to whom we are indebted for specimens."

In a fossil state *T. reticulata* has been found in the Pleistocene of the Labrador coast, by Packard.

TURRITELLOPSIS ACICULA (Stimpson).

Turritella acicula, Stimpson (1851).

Turritellopsis acicula, G. O. Sars (1878).

Grand Manan Island, "dredged in 4 fathoms sand off Point Franklin, and also found alive at low-water mark under stones" (Stimpson). Annapolis Basin, one dead specimen (Verkrusen). Halifax Harbour, N.S. (J. M. Jones); Murray Bay (Sir J. W. Dawson); off Caribou Island, in 50 fathoms

hard bottom, one individual (Packard). Dead Island, near Square Island, Labrador, 1 to 4 fathoms, mud, "a few good though dead specimens," Stearns expedition (Miss Bush).

Fossil in the Pleistocene of Rivière du Loup and Labrador (Sir J. W. Dawson).

Family *Trichotropidae*.

TRICHOTROPIS BORREALIS, Broderip and Sowerby.

Grand Manan, "rarely taken alive though dead shells are not uncommon in the coralline zone" (Stimpson). Fishing banks off Halifax (Willis); Halifax Harbour (J. M. Jones); Le Have Bank, N.S., in 45 fathoms, abundant, U. S. Fish Commission, 1872 (Smith and Harger). Gulf and mouth of the River St. Lawrence, off Grande Grève, Gaspé Bay, in 30 to 40 fathoms, and elsewhere (Whiteaves); Little Métis and Murray Bay (Sir J. W. Dawson); St. Anne and near Cap Chatte (Bell); off Caribou Island, frequent in 10 to 50 fathoms (Packard, Atlantic coast of Labrador, at Long Island, 15 fathoms, and Hopedale, in 10 fathoms (Packard). Strait of Belle Isle, at L'Anse au Loup, 10 fathoms; Atlantic coast of Labrador, at Henley Harbour, 3 to 15 fathoms; Temple Bay, 10 fathoms; Dead Island, near Square Island, 2-4 fathoms; Stearns' expedition (Miss Bush); Greenland (Möller, as *T. Atlantica*, Beck); Ashe Inlet and Port Burwell, Hudson Strait (Bell).

Fossil at Rivière du Loup, Chaudière Station, Montreal, Labrador, etc. Very abundant at Montreal (Sir J. W. Dawson).

TRICHOTROPIS CONICA, (Beck) Möller.

1842. Index Molluscorum (Greenlandica, p. 12.

"A single dead but large and characteristic specimen of this very distinct species was taken in the Gulf of Maine, off Cape Sable, Nova Scotia, by the U. S. Fish Commission party on the Speedwell in 1877" *(Verrill).

Family *Cerithiidae*.

BITTIUM NIGRUM (Totten).

Pasithea nigra, Totten (1834).

Cerithium reticulatum, Totten (1835); non Da Costa.

Cerithium Sayii, Menke (1841).

Bittium nigrum, Stimpson (1860).

Halifax (Willis); whole Atlantic coast of Nova Scotia (J. M. Jones); on eel grass, Pictou, and south shore of Prince Edward Island (Sir J. W.

* Transactions of the Connecticut Academy of Arts and Sciences, vol. v., p. 519.

Dawson); low-water at Pointe du Chêne, Shediac Bay, N.B. (Whiteaves); Bedeque, P.E.I., common (Rev. H. W. Winkley). Not found on the coast of Maine, nor in the Bay of Fundy (Verrill). In the Bulletin of the Museum of Comparative Zoology at Cambridge, Mass., for April, 1899, vol. xviii, p. 257, Dr. Dall says that this shell is identical with the *Turritella alternata* of Say.

CERITHIOPSIS COSTULATA (Möller).

Turritella? costulata, Möller (1842.)

Cerithium arcticum, Mürch (1857).

Cerithiopsis costulata, G. O. Sars (1878).

"A good living example of this arctic species was dredged by me, in the Bay of Fundy, in 1870. It may be easily distinguished by the elevated spire, having the whorls crossed by regular and strong, rounded ribs, nearly as in *Scalaria*, with a basal carina, in line with the outer lip, and with revolving lines crossing the furrows between the ribs. The canal is short, but deeply cut and slightly recurved" * (Verrill). The two specimens from the deep sea mud in the Gulf of St. Lawrence, that were identified with this species by the writer in 1873, are the types of Verrill's *Lovenella Whiteavesii*, described in 1880, the name of which has since been changed to *Cerithiella Whiteavesii*.

CERITHIOPSIS GREENII (Adams).

Cerithium Greenii, C. B. Adams (1838).

Bittium Greenii, H. and A. Adams (1858).

Cerithiopsis Greenii, Verrill (1873).

According to the Rev. H. W. Winkley, † this species is not infrequent on the oyster beds at Summerside, P.E.I., and it occurs also at Bedeque.

CERITHIELLA WHITEAVESII, Verrill.

Cerithiopsis costulatus, Whiteaves (1873); non *Turritella costulata*, Möller.

Lovenella Whiteavesii, Verrill (1880).

Cerithiella Whiteavesii, Verrill (1882).

Two living examples of this shell were dredged by the writer in 1873, in the Gulf of St. Lawrence, between the Island of Anticosti and the Gaspé peninsula, one in 110 and the other in 200 fathoms.

* Transactions of the Connecticut Academy of Arts and Sciences, vol. v., p. 522.

† Bulletin of the Natural History Society of New Brunswick, No. VII. (1888) p. 70.

Family *Aporrhaidæ*.

APORRHAIIS OCCIDENTALIS, Beck.

Rostellaria (Aporrhais) occidentalis, Beck (1836).*Rostellaria occidentalis*, Gould (1841).*Aporrhais occidentalis*, Sowerby (1847); et auct.*Arrhogeis occidentalis*, Gabb (1868).

Bay of Fundy, Atlantic coast of Nova Scotia, Gulf and mouth of the River St. Lawrence, at many localities, northward to Hopedale, on the Atlantic coast of Labrador, abundant, living, in from 10 to 60 fathoms. In 1871 a living and adult example of a thin, inflated variety of this shell was dredged by the writer, N.E. of the Island of Anticosti, in 120 fathoms, mud.

On sandy or muddy bottoms the shells of this species are beautifully perfect and their sculpture is well preserved. But, upon rocky bottoms, or bottoms of loose stones, the shells, even of living specimens, are much broken, and their surface markings almost or quite obliterated.

Packard has found *A. occidentalis* fossil at Tertiary Bay, Labrador.

RHACHIGLOSSA.

Family *Muricidæ*.

UROSALPINX CINEREA (Say).

Fusus cinereus, Say (1822 and 1831).*Urosalpinx cinerea*, Stimpson (1865).

Prince Edward Island (Sir J. W. Dawson, 1871); Charlottetown Harbour, P.E.I. (F. Bain, 1875).

TROPION TRUNCATUS (Ström).

Tritonium clathratum, O. Fabricius (1780); but non L., teste G. O. Sars.*Buccinum truncatum*, Ström; fide Jeffreys and G. O. Sars.*Fusus Bamffus* (Donovan) Gould (1841).*Tritonium clathratum*, Stimpson (1863).*Trophon clathratus*, Stimpson (1860); and Gould (1870).*Trophon truncatus* (Ström) G. O. Sars (1878).

Grand Manan, "on a patch of shelly bottom, about two miles north of Duck Island" (Stimpson); Annapolis Basin (Verkruzen). Fishing banks off Halifax (Willis); Halifax Harbour (J. M. Jones). Gulf of St. Lawrence, Gaspé Bay, in about 30 fathoms (Whiteaves); Ruisseau de la Grand Vallée, (Bell). Probably a small and finely ribbed form of the next species.

TROPHON CLATHRATUS (L.).

Murex clathratus, L. (1767).

Fusus scalariformis, Gould (1838 and 1841).

Trophon scalariformis, Stimpson (1860); and Gould (1870).

Trophon clathratus, G. O. Sars (1878).

Fishing banks off Halifax (Willis); Halifax Harbour (J. M. Jones). Between Cape Gaspé and Cap des Rosiers, in 75-80 fathoms, stones; and north shore of the St. Lawrence, off St. John River and near the west point of Anticosti, in 60 fathoms, sand (Whiteaves); Little Métis, Rivière du Loup and Murray Bay, (Sir J. W. Dawson); Peter River, St. Anne and Marsouin (Bell); bank off Caribou Island (Packard). Chateau Bay, Labrador, 50 fathoms; and Henley Harbour, 20 fathoms (Packard).

It is not quite clear to the writer whether the "*Tritonium clathratum*, Müll.," of Stimpson's Synopsis of the Marine Invertebrata of Grand Manan; or the *Trophon clathratum*, (Linné) Möller," of Miss Bush's list of the mollusca dredged on the coast of Labrador by the Stearns expedition, should be referred to this or to the preceding species.

In a fossil state, *T. clathratus*, as here defined, has been found in Pleistocene deposits at Rivière du Loup, Murray Bay, Montreal, and Labrador.

TROPHON CLATHRATUS, var GUNNERI.

Tritonium Gunneri, Lovén (1846).

Murex (Trophon) Gunneri, Mörch (1867).

Trophon Gunneri, H. and A. Adams (1858).

Trophon clathratus, var *Gunneri*, G. O. Sars (1878).

Bay of Fundy, off Grand Manan (Verrill); Le Have Bank, in 45 and 60 fathoms, U.S. Fish Commission, 1872 (Smith and Harger); off Cape Sable, N.S., 59 fathoms,—and mouth of Halifax Harbour, 16 and 18 fathoms, 1877, U.S. Fish Commission SS. Speedwell (Verrill). Gaspé Bay, living, in about 30 fathoms (Whiteaves); Métis (Sir J. W. Dawson).

Gould's *T. scalariforme* was based upon specimens in which the thin laminar varices of the shell are almost obliterated. So far as the writer's experience goes, this obliteration of the varices is due to the fact that such specimens are usually found on rough bottoms of loose stones or rock at some distance from land. In *T. Gunneri*, which is generally found on muddy or sandy bottoms, in sheltered bays, the varices are well developed and beautifully preserved.

TROPHON FABRICII (Beck) Möller.

Tritonium oraticulatum, O. Fabricius (1780); non L.

Trophon Fabricii (Beck) Möller (1842).

Trophon oraticulatus, G. O. Sars (1878).

Fishing banks off Halifax (Willis). Orphan Bank; off Cap Bon Ami, P.Q.; between Cape Gaspé and Cap des Rosiers, in 38 fathoms, stones; and north shore of the St. Lawrence, off the St. John River, and near the West Point of the Island of Anticosti, in 50 fathoms, sand (Whiteaves); Mingan (J. Richardson, Jun). Ashe Inlet, Hudson Strait (Bell); Greenland (Fabricius).

Family *Purpuridæ*.

PURPURA LAPILLUS (L.)

Buccinum lapillus, L. (1767).

Purpura lapillus, Lamarck (1822); et auct.

This species is said to be common at low-water in the Bay of Fundy and Atlantic coast of Nova Scotia, but its exact range in the River and Gulf of St. Lawrence has yet to be ascertained. In the latter region it has long been known to occur on the Gaspé coast, from Gaspé Bay to Métis, and all round the Island of Anticosti, but there are no records of its having been taken on the north shore. Although recorded as a Greenland shell by Fabricius and Möller, Packard failed to find it on the north shore of the Gulf, near the Strait of Belle Isle, or on the Labrador coast. Its name is not included in Miss Bush's list of the Mollusca dredged on the Labrador coast by the Stearns expedition, and there are no specimens of it in the collections made of late years in Hudson Bay and Strait.

In a fossil state *P. lapillus* is common in the English Pliocene. It is found also in the Pleistocene of Scandinavia and Maine, but its name does not occur in Sir J. W. Dawson's latest list of Canadian Pleistocene fossils.

Family *Columbellidæ*.

ASTYRIS ROSACEA (Gould).

Buccinum rosaceum, Gould (1840).

Columbella rosacea, Stimpson (1851).

Astyris rosacea, H. and A. Adams (1858).

Sparsely distributed throughout the entire region, in depths of from 8 to 60 fathoms. Miss Bush says that a few good specimens were taken at

L'Anse au Loup, in 18 fathoms, and at Henley Harbour, in 3 to 8 fathoms, by the Stearns Labrador expedition in 1882. The species has been collected in the Pleistocene beds of Rivière du Loup, and in glacial deposits in Scotland.

Living examples of this shell, from the Gulf of St. Lawrence, have been referred to *Astyris Holbollii* (= *Fusus Holbollii*, Beck, in Möller) on the authority of Jeffreys, but Verrill thinks that *A. rosacea* is probably distinct from *A. Holbollii*, and even if the two shells should prove to be identical, the former is much the older name.

ASTYRIS LUNATA (Say).

Nassa lunata, Say (1826).

Buccinum lunatum, C. B. Adams (1838).

Columbella lunata, Gould (1870).

Astyris lunata, Dall (1870).

Shediac Bay (Whiteaves, 1873); Summerside, P.E.I. (Rev. H. W. Winkley, 1888).

ASTYRIS ZONALIS (Linsley).

Buccinum zonalis, Linsley (1845); no description; and Gould (1848).

Columbella dissimilis, Stimpson (1851).

Astyris zonalis, Verrill (1872).

"This species occurred only once, but then in great numbers, at a haul of the dredge on a sandy spot in 8 fathoms, about two miles north-east of Cheney's Head," Grand Manan Island (Stimpson). Dall, however, says that Stimpson's *C. dissimilis* is a "rude purplish brown rather large northern form of *A. lunata*," and that Linsley's *Buccinum zonalis* is "a form in which the brown coloration of the original *lunata* coalesces to form two or more dark bands with lighter interspaces."*

ANACHIS HALIETI (Jeffreys).

Columbella Haliæti, Jeffreys (1867).

Anachis Haliæti, Verrill (1874).

Pyrene costulata, G. O. Sars (1878); but not *Fusus costulatus*,
Cantraine, fide Dall, and Norman.

Anachis costulata, Verrill (1880).

Anachis haliæti, Dall (1889); and Norman (1899).

"South of Halifax, N.S., 95 fathoms, 1877, and off Cape Cod, 67 to 96 fathoms, 1879,—U.S. Fish Commission SS. Speedwell" (Verrill).

* Bulletin of the Museum of Comparative Zoology (1889) vol. XVIII., pp. 189 and 190.

Family *Nassidae*.

NASSA (ILYANASSA) OBSOLETA, Say.

Nassa obsoleta, Say (1822); et auct.*Ilyanassa obsoleta*, Stimpson (1865).

St. Mary's Bay, N.S. (Verkruzen); Annapolis Basin (J. M. Jones); Minas Basin (Ganong); North-west Arm, Halifax Harbour, —Pictou, &c. (Willis). Beach at Pointe du Chêne, N.B. (Whiteaves); Summerside, P.E.I. (Rev. H. W. Winkley); vicinity of Cape Gaspé (Bell). Verrill says that this species has not been found in the Bay of Fundy, and it has not been found in the Canadian Pleistocene.

NASSA (TRITIA) TRIVITTATA, Say.

Nassa trivittata, Say (1822).*Tritia trivittata*, H. and A. Adams (1858).

Bay of Fundy and Atlantic coast of Nova Scotia, from low-water mark to a depth of 60 fathoms. In the Gulf of St. Lawrence the species has been taken at several localities on both sides of Northumberland Strait, in the Baie des Chaleurs as far up as Dalhousie, northward to Gaspé Bay, where Sir J. W. Dawson dredged specimens of it in 4 fathoms sand, near the shore, in 1858. The writer has collected similar specimens a little above the village of Gaspé Basin, where the water is brackish.

Family *Buccinidae*.

BUCCINUM UNDATUM, L.

Buccinum undatum, L. (1761); et auct.*Buccinum undulatum*, Möller (1842).*Buccinum Labradorensis*, Reeve (1846).

Living specimens of a shell that is practically indistinguishable from the *B. undatum* of the British Islands and northern Europe, are not uncommon locally throughout the entire region, at low-water mark, and at depths down to 170 fathoms or more. Some of these shells, too, attain to as large a size as the largest British or Norwegian specimens.

Similar specimens have been dredged as far to the southward as the coast of New Jersey, and on the Labrador coast Packard finds *B. undatum* "most abundant just below low-water mark, where fine specimens, 3½ inches long, are frequent." Miss Bush, in her list of the Mollusca and Echinodermata obtained by the Stearns expedition, says that it occurs abundantly along the coast of Labrador in 1 to 15 fathoms; and Dall, that several living specimens were collected at Davis Inlet, Labrador, by L. M. Turner in 1882.

Sir J. W. Dawson, who has made a special study of the recent and fossil Buccinums of eastern Canada, says that *B. undatum* is found fossil in the Saxicava sand and Leda clay of Maine; Duck Cove, St. John, N.B.; Anticosti, Rivière du Loup; and Labrador. In regard to the Canadian specimens that he refers to *B. undatum*, he adds the following remarks. "I cannot satisfy myself that there is any good specific distinction between this shell and *B. undatum* of the European seas and glacial beds. "It varies very much in size, in slenderness, in the fineness of the spiral striation, in the development of the ribs, in the extension of the mouth, and in the thickness of the shell. The coarser forms are *B. Labradoricum*, which passes into the ordinary *undatum*. Medium varieties are *B. undulatum*, and smooth varieties pass into *B. cyaneum* and *B. Totteni*, which last is the *ciliatum* of Gould."*

BUCCINUM TOTTEII, Stimpson.

Buccinum ciliatum (pars) Gould (1841); but not *Tritonium ciliatum* of O. Fabricius.

Buccinum ciliatum, Dawson (1857); non Fabricius; fide Verrill.

Buccinum Totteni, Stimpson (1865); et auct. Am.

Little Métis, Tadoussac, and Murray Bay (Sir J. W. Dawson). Henley Harbour, Château Bay,—and Temple Bay, Labrador, in 8 to 15 fathoms, "three shells corresponding to the Canadian form from off Métis,"—Stearns expedition (Miss Bush).

Fossil in the Saxicava sand and Leda clay at Rivière du Loup (Sir J. W. Dawson).

In the remarks that follow the original description, Dr. Stimpson says of *B. Totteni* that it is "allied to *B. Humphreysianum*, but differs in its plicated and more convex whorls, deeper transverse sculpture and want of colour. It might be taken for a thin and delicate form of *B. undulatum*, but is easily distinguished by the number and straightness of the longitudinal plications of the spire-whorls, the more numerous and sharply cut transverse ridges, and the wider mouth. From *B. ciliatum* it differs very much, both in shape and in the want of a tooth-like fold on the columella."† Verrill, however, thinks that the *B. Humphreysianum* of Stimpson is not *B. Humphreysianum*, Bennett, and calls the former *B. Gouldii*. Sir J. W. Dawson says that *B. Totteni* "is remarkable for its very regular spiral lines, absence of folds, and convex whorls."

* The Canadian Ice Age, page 235.

Canadian Naturalist and Geologist, New Series, vol. II., pp. 385 and 386.

BUCCINUM CYANEUM, Bruguière.

- Tritonium undatum*, O. Fabricius (1780); non L.
Buccinum cyaneum, Bruguière (1792).
Buccinum boreale, Leach (1819).
Buccinum Humphreysianum, Möller (1842); non Bennett.
Buccinum hydrophanum, Hancock (1846).
Buccinum sericatum, Hancock (1846).
Buccinum tenebrosus, Hancock (1846); non Möller.
Buccinum undulatum, Hancock (1846); non Möller.
Tritonium Grœnlandicum, Mörch (1857).
Buccinum cyaneum, Stimpson (1865); on whose authority the previous
 synonyms are given.
Buccinum Grœnlandicum, G. O. Sars (1878); non Stimpson.

Specimens of this species are recorded as having been dredged on the Le Have Bank, N.S., in 45 fathoms, on the U.S. Fish Commission SS. Bache in 1872, by Professor S. I. Smith and Mr. O. Harger. Other records for *B. cyaneum* on the coast of Nova Scotia are as follows: "Off Cape Sable, N.S., in 82 to 91 fathoms, fine compact sand, where it was common, and off Halifax, in 100 fathoms"; dredged by the SS. Speedwell, of the U.S. Fish Commission, in the summer of 1877. "It has often been brought in from the banks off Nova Scotia" (Verrill, 1882; in Catalogue of Marine Mollusca added to the Fauna of New England, etc.,—in Trans. Conn. Acad. Arts and Sc., vol. v, pp. 492 and 493).

Sir J. W. Dawson records the occurrence of recent specimens, that he identifies with this species, at Little Métis, Tadoussac, and Murray Bay; and Dall says that a living specimen of *B. cyaneum* was found on Labrador's Reef, near Fort Chimo, Ungava Bay, by L. M. Turner in 1883.

Sir J. W. Dawson says that *B. cyaneum* is abundant fossil in the Pleistocene deposits at Rivière du Loup.

In reference to the specific name of this shell, Professor Verrill makes the following remarks. "Mörch, in adopting *Grœnlandicum* for this species, simply took up a part of the polynomial name used by Chemnitz, which has no claims to priority under the ordinary rules of binomial nomenclature. "Stimpson, therefore, very properly rejected that name, as applied to this species, and adopted the first distinctive binomial name given to it. Jeffreys has followed Mörch in using *B. Grœnlandicum*, and various other European writers have followed the same usage, apparently without sufficient reason. This has given rise to much confusion, because *Grœnlandicum* has been extensively used for a very different species by Hancock, Reeve, Stimpson, and other writers" (Verrill, 1882; op. cit. p. 494).

BUCCINUM CYANEUM, var. PERDIX (or FINMARCHIANUM).

Tritonium granlandicum, var. *perdix* (Beck) Mörch (1869).

Tritonium granlandicum, var. *glabrum*, Mörch (1869).

Buccinum finmarchianum (Verkrüzen) Friele (1877); and G. O. Sars (1878).

Buccinum granlandicum, var. *finmarchianum*, Jeffreys (1880).

Buccinum cyaneum, variety, *Perdix* or *Finmarchianum*, Verrill (1882).

Professor Verrill (op. cit., pp. 492 and 493) says that specimens of *B. cyaneum* were dredged by the U. S. Fish Commission, on the Le Have Bank, in 1872, off Cape Sable, and off Halifax, N.S., in 1877. "Some of our specimens," he adds, "belong to the dark variety *tenebrosus*, Han.; others are near the variety *Finmarchianum*, Verkrüzen. The variety *perdix* or *glabra*, Mörch (Catal. Moll. Spitzberg., p. 14, 1869) is probably the same thing as the latter."

BUCCINUM CYANEUM, var. PATULUM.

Buccinum granlandicum, var. *patulum*, G. O. Sars (1878).

Buccinum cyaneum, var. *patulum*, Verrill (1882).

"From Murray Bay, mouth of the St. Lawrence River, Principal Dawson has sent me specimens of a peculiar rather small form, belonging apparently to this species. The aperture is unusually broad, with the lip expanded and patulous anteriorly, projecting decidedly beyond the columella. The surface is eroded, but was nearly smooth, without ribs, and with fine wavy, unequal spiral lines, mostly indistinct; one specimen has several larger, distant, raised spiral lines. The colour is dark brownish; inside of aperture purplish or livid brown." "Fossil in the Post-pliocene of Canada" (Verrill; op. cit., p. 494.)

BUCCINUM TENUE, Gray.

Buccinum tenue, Gray (1839); teste Stimpson.

Buccinum scalariforme (Beck) Möller (1842).

"Dredged alive, in considerable numbers, in 1877, by the U. S. Fish Commission SS. Speedwell, off Cape Sable, N.S., in 88 to 91 fathoms, on a bottom of fine compact sand, associated with *B. cyaneum* and *Sipho pubescens*. Also off Cape Sable, 22 miles, 59 fathoms; mouth of Halifax Harbour, 21 fathoms, 9 living young; off Halifax, 9 to 12 miles, 42 to 92 fathoms. It had not been found so far south previously. These specimens all belong to a small race of the species" (Verrill; op. cit., p. 495).

The typical form had previously been dredged at many localities in the Gulf and mouth of the River St. Lawrence, by the writer, and Sir J. W. Dawson, and just inside of the Strait of Belle Isle by Packard. In the writer's experience, *B. tenue* is the commonest species of *Buccinum* in the Gulf of St. Lawrence, at depths of from about 10 to 60 fathoms. It occurs

in each of the collections made at Port Burwell and Ashe Inlet, Hudson Strait, by Dr. Bell in 1884.

Sir J. W. Dawson says that it is "much more plentiful in the Pleistocene beds" of eastern Canada, than as a living shell, and that in a fossil state it has been found at St. John, etc., N.B.; at Rivière du Loup, Labrador and Greenland.

BUCCINUM CILIATUM (Fabricius).

Tritonium ciliatum, O. Fabricius (1780); teste Stimpson and Verrill.

Buccinum ciliatum, Möller (1842).

Buccinum ciliatum, Gould (1841 and 1870); in part only, not the figures (Verrill).

"Dr. Stimpson mentions a specimen from Nova Scotia received from Mr. J. R. Willis, but the collection of Mr. Willis was largely derived from the bank fisheries, and his specimen may have come from the Grand Bank" (Verrill; op. cit., pp. 498 and 499). Jeffreys has identified with this species a specimen dredged by the writer in 1871, north of the Island of Anticosti, in 112 fathoms; and Sir J. W. Dawson says that he has collected recent specimens of *B. ciliatum* off Little Métis, at Rivière du Loup and Murray Bay. Miss Bush also includes the name of this species in her "Catalogue of the Mollusca and Echinodermata dredged on the coast of Labrador by the Stearns expedition," and says that "this species was found in 3 to 8 fathoms at Henley Harbour."

Sir J. W. Dawson records *B. ciliatum* as having been found fossil in the Post-Pliocene deposits at Rivière du Loup and Montreal.

According to Stimpson "the appressed form of the shell, narrow, somewhat canaliculated aperture, and the tooth on the columella, are its prominent characters."*

BUCCINUM GOULDII, Verrill.

Buccinum ciliatum (pars) Gould, 1841, fig. 209; and 1870, fig. 635?

Buccinum Humphreysianum, Stimpson (1865); non Bennett.

Buccinum Gouldii, Verrill (1882).

"This name is proposed, provisionally, for the shell figured by Gould (ed. 1), and described as *B. Humphreysianum* by Dr. Stimpson. It differs from the European species, of that name, as already mentioned by Jeffreys and others, in having a ciliated epidermis and in other characters.

"This shell is remarkable for its swollen, rounded whorls, the deep excavation of the columella-lip, the anterior expansion of the rounded outer lip, and the thinness and nearly smooth surface of the shell.

"This shell may, perhaps, prove to be only a variety of some previously known species. In that case *Gouldii* may still be used as a variety name,

* Canadian Naturalist and Geologist, New Series, vol. II., p. 374.

to designate the form. It does not appear to correspond with any of the forms described by European writers.

"A specimen that I suppose to be the young of this species is a small, very thin, translucent, pale yellow, smooth shell, with an acute spire, a very small, regularly spiral nucleus, five convex whorls, impressed suture, and excavated columella-lip. The whorls are evenly rounded and with faint traces of shallow spiral lines, no undulations. This was dredged by Messrs. Smith and Harger, on Le Have Bank, 60 fathoms, in 1872. This may possibly be the young of *B. hydrophanum*." (Verrill; op. cit., pp. 497 and 498).

BUCCINUM GLACIALE, L.

Buccinum glaciale, L. (1758); et auct.

Buccinum carinatum, Phipps (1774).

Tritonium glaciale, O. Fabricius (1780).

Off Little Métis, and Murray Bay, Sir J. W. Dawson; Bonaventure Island, off Percé, at low-water, one specimen collected by T. Curry, in 1872; Ashe Inlet, Hudson Strait, one specimen of the double-keeled variety, dredged by Dr. R. Bell in 1884; Greenland, Fabricius; Alaska, Dall.

In a fossil state *B. glaciale* has been found in the Pleistocene deposits at Black Point, N.B.; at Anticosti, Rivière du Loup, and Montreal, P.Q.; and at Labrador.

According to Sir J. W. Dawson, *B. glaciale* "has the aperture somewhat like that of *B. ciliatum*, and a very peculiar sculpture of spiral striæ with intervening bands marked with finer striæ. It has also a carina angulating the body whorl and sometimes more than one. In the latter case it passes into *B. Grælandicum*, Hancock (not Chemnitz) or *B. Hancocki*, Mörch." "The ordinary variety is most common in the modern Gulf (of St. Lawrence), the latter in the Arctic seas and in the Pleistocene. This shell, usually much decorticated, is the most common *Buccinum* in the Pleistocene of Montreal.*

In his latest list of Canadian Pleistocene fossils, and immediately after the four lines last quoted, Sir J. W. Dawson cites *Buccinum plectrum*, Stimpson, as occurring recent at Portland, Maine, and Murray Bay; and fossil at Rivière du Loup. The types of *B. plectrum* are from the Arctic Ocean north of Behring's Sea, and Dall has since found specimens of it on the coast of Alaska. It appears to be the only true *Buccinum* that has yet been found in the seas of British Columbia, and its occurrence on the Atlantic coast of North America would seem to require confirmation. In the Museum of the Survey there are three recent and fresh specimens from Métis labelled *B. plectrum* on Sir J. W. Dawson's authority, but it is difficult to see how these can be distinguished from the Labrador specimen of *B. Tottensi*,

* The Canadian Ice Age, Montreal, 1893, page 257.

Stimpson, that Miss Bush figures on Plate ix. of the sixth volume of Proceedings of the U. S. National Museum. Under the heading of *B. plectrum*, too, Sir J. W. Dawson expressed the opinion that only five of the Buccinums found living in the Gulf of St. Lawrence, on the coast of the Maritime Provinces, or in the Pleistocene deposits of eastern Canada, viz., *B. undatum* (*undulatum*), *B. cyaneum* (*Grœnlandicum*, auct.), *B. tenue*, *B. ciliatum*, and *B. glaciale*, are probably entitled to rank as "distinct specific types."

BUCCINUM DONOVANI, Gray.

Buccinum glaciale, Donovan (1799); Gray (1824); and Brown (1827);

but not *B. glaciale*, L. (1758).

Buccinum Donovan Gray (1839); et auct.

Buccinum tubulosum, Reeve (1847).

Tritonium Donovan, Mörch (1867).

Off Little Métis (Sir J. W. Dawson); Banks of Newfoundland (Stimpson); Henley Harbour, Chateau Bay, Labrador, at low-water and 15 fathoms, Stearns expedition (Miss Bush); Greenland (Mörch).

"The *B. Donovan* is a species of very recent origin and has not, I believe, been found anywhere in a fossil state. It differs from *B. glaciale* in its elongated form, more convex whorls, more concave columellar lip, and more convex spiral ridges. The uncarinated variety may be distinguished from *B. undatum* by the character of the spiral grooving, the distinction between the primary and secondary grooves being far more strongly marked than in that species. The *Buccinum Donovan* in Mr. Bell's list of the shells of the Gulf of St. Lawrence is the *Fusus Kroyeri* of Möeller" * (Stimpson, 1865).

NEPTUNEA DESPECTA, var. TORNATA, Gould.

Fusus tornatus, Gould (1839, 1841 and 1870).

Neptunea despecta (L.) forma typica, G. O. Sars (1878).

Neptunea despecta, var. *tornata*, Verrill (1882).

Gulf of St. Lawrence north of the Baie des Chaleurs, and mouth of the River St. Lawrence, in from 10 to 60 fathoms. The writer has dredged this species sparingly on the Orphan Bank and in Gaspé Bay; Bell has obtained it near St. Anne and at Rimouski Village; Sir J. W. Dawson has dredged many large specimens off Little Métis; Verrill, a "large dead shell," at the Mingan Islands; and Packard, "a large specimen tenanted by a hermit crab," on the north shore of the Gulf, off Caribou Island, just inside of the Strait of Belle Isle.

This variety of *N. despecta* has been found fossil in Pleistocene deposits at New Richmond, River Charles, &c., N.B.; at Rivière du Loup, Murray Bay, Quebec, and Montreal, P.Q.; and at Labrador.

* Canadian Naturalist and Geologist, New Series, vol. II, p. 370.

NEPTUNEA DECEMCOSTATA (Say).

Fusus decemcostatus, Say (1826); et auct.

Tritonium dcoemcostatum, Stimpson (1851); but perhaps not of Middendorf.

Neptunea decemcostata, H. and A. Adams (1858).

Bay of Fundy and Atlantic coast of Nova Scotia, from low-water to 45 fathoms, but not certainly known to occur so far northward as the Gulf of St. Lawrence. The "*Chrysodomus decemcostatus*" of the writer's list of mollusca dredged off Grande Grève in 1867 is certainly not that species but *N. despecta*, var. *tornata*, and it is most probable that the specimens collected by Logan near Cape Gaspé in 1844 and referred by Bell to *Fusus decemcostatus*, are also *N. tornata*. Verkrutzen says that he found varieties of *N. decemcostata*, with nine, eleven and twelve ribs, at Annapolis Basin, N.S., but that these are very rare.

VOLUTOPSIS NORVEGICA (Chemnitz).

Fusus (Volutopsius) norvegicus, Mörch (1857).

Volutopsis norvegica, G. O. Sars (1878); et auct.

One living but immature specimen of this very rare shell was dredged by the writer on the Bradelle Bank in 1873; and an adult, but very much water worn example was taken off Bonaventure Island in 1872.

In the Proceedings of the U. S. National Museum for 1886 (page 303) Dall claims that the generic name *Strombella*, Gray, should be preferred to that of *Volutopsius*, Mörch, (since changed to *Volutopsis*), but Verrill says that *Strombella* "had been preoccupied."

SIPHO STIMPSONI (Mörch).

Fusus corneus, Say (1831); non Linné, Pennant, &c.

Fusus Islandicus, Gould (1841); non L.

Tritonium Islandicum (Loven) Stimpson (1853).

Fusus Stimpsoni, Mörch (1867).

Fusus curtus, Jeffreys (1867).

Neptunca curta, Verrill (1873).

Sipho Stimpsoni, Verrill (1881).

Bay of Fundy, from low-water to 80 fathoms, Atlantic coast of Nova Scotia, and Sable Island. In the Gulf of St. Lawrence, a small living specimen (about 34 mm. in length) dredged by the writer in 1871 off Charleton Point, Anticosti, in 112 fathoms, is apparently referable to this species, though one of the specimens formerly referred by the writer to *S. curtus* clearly belongs to the species since described by Verrill as *S. pubescens*.

SIPHO OSSIANI (Friele).

Neptunea Ossiani, Friele (1879); by typ. error *Ossiania*.
Sipho Ossiani, Verrill (1882).

A specimen, which Professor Verrill has identified with this species, was dredged at Murray Bay by Sir J. W. Dawson, and is now in the Redpath Museum at Montreal. The only other specimen of this shell that has been recorded from American waters, "was obtained near the Grand Bank in 180 fathoms and presented to the U. S. Fish Commission by Capt. McCormick and crew, schooner Wachusett of the Gloucester fishing fleet" (Verrill).

SIPHO PUBESCENS, Verrill.

Neptunea propinqua, Verrill (1878); non Alder.
Neptunea (Sipho) propinqua, Verrill (1880).
Sipho pubescens, Verrill (1882).

"Off Cape Sable, N.S., in 88 to 91 fathoms, fine compact sand, where it occurs in considerable numbers, living; and off Halifax, 42 fathoms, dead"; U. S. Fish Commission S.S. Speedwell, 1877 (Verrill). North shore of the Gulf of St. Lawrence, off Egg Island (between Pointe des Monts and Seven Island Bay) in 70-80 fathoms, sandy mud, one adult living specimen, dredged by the writer in 1871.

SIPHO PYGMÆUS (Gould).

Fusus Islandicus, var. *pygmæus*, Gould (1841).
Tritonium pygmæum, Stimpson (1851).
Neptunea (Sipho) pygmæa, H. and A. Adams (1858).
Fusus pygmæus, Gould (1870).
Neptunea (Neptunella) pygmæa, Verrill (1873).
Sipho pygmæus, Verrill (1882).

Bay of Fundy, Atlantic coast of Nova Scotia, and Gulf of St. Lawrence as far to the northward at least as Gaspé Bay, where the writer has dredged it, living, in about 30 fathoms. The species is common on the New England coast, and according to Verrill, its bathymetrical range is from low-water to 430 fathoms.

SIPHO SPITZBERGENSIS (Reeve).

Fusus Spitzbergensis, Reeve (1855).
Neptunea (Sipho) terebralis, Gould (1860).
Sipho lividus (Mörch) Verrill (1883).
Chrysodomus Spitzbergensis, Dall (1886).

A few living specimens of this shell were dredged by the writer in Gaspé Bay in 1871; in 60 fathoms off Bonaventure Island, in 1872; and on the

Orphan bank in 1873. Sir J. W. Dawson has dredged fine living examples of the same shell at Murray Bay and Métis. Miss Bush says that "two good though dead, specimens were found at Henley Harbour in 8 fathoms, and Dead Island, near Square Island, in 1 to 4 fathoms" by the Stearns Labrador expedition in 1882. Dall, also, states that "one imperfect specimen" was found by L. M. Turner in 1883 "on the upland near Fort Chimo, Ungava Bay," where it had doubtless been carried by the ravens as is their wont."

Sir J. W. Dawson states that a single small specimen of this shell has been found in the Pleistocene deposits at Montreal.

SIPHO VENTRICOSUS (Gray).

Fusus ventricosus, Gray (1839); and Gould (1841 and 1870).

Neptunus ventricosa. Verrill (1879).

Sipho ventricosus, Tryon (1881); and Verrill (1882).

Bay of Fundy, one specimen (Verkrusen); Sable Island, Willis (Gould, 1870).

TRITONOFUSUS KROYERI (Möller).

Fusus Kroyeri, Möller (1842); teste Stimpson (1865).

Fusus (Tritonofusus) Kroyeri, Mörch (1857).

Buccinum cretaceum (Reeve) Packard (1863).

Buccinofusus Kroyeri, Whiteaves (1869).

Tritonofusus Kroyeri, Whiteaves (1872); also Verrill (1879 and 1882).

Northern portion of the Gulf and mouth of the River St. Lawrence, at depths of from about 10 to 50 or 60 fathoms; also coast of Labrador in from 3 to 10 fathoms. In the former region it has been dredged on the Orphan Bank and in Gaspé Bay by the writer; in Salmon Bay (on the north shore of the Gulf, just inside of the Strait of Belle Isle) by Packard; off Little Métis, by Sir J. W. Dawson; and Dr. Bell (who referred his specimens to *Buccinum Donovanii*) says that the species occurs at "several localities" (on the Gaspé coast) "below St. Flavie." On the Labrador coast, Miss Bush says that specimens were dredged in Henley Harbour and Temple Bay, in 3 to 10 fathoms, by the Stearns expedition; and two immature and dead examples of this shell were collected on the beach between Hamilton Inlet and Sandwich Bay, by Mr. Low in 1894.

In a fossil state the species has been recorded by Sir J. W. Dawson as occurring in the Pleistocene deposits of New Richmond and River Charles N.B.; of Rivière du Loup, P.Q.; and Labrador.

TRITONOFUSUS LATERICEUS (Möller).

Fusus latericeus, Möller (1842).

Fusus (*Tritonofusus*) *latericeus*, Mörch (1857).

Tritonofusus latericeus, Whitaves (1873).

Sipho latericulus, Verrill (1882).

Bradelle Bank, Gulf of St. Lawrence, one adult living specimen, dredged by the writer in 1873; Greenland, Möller; northern coast of Norway and Finmark (20 to 30 fathoms); and Spitzbergen (146 to 357 fathoms).

TRITONOFUSUS SYRTENSIS (Packard).

Fusus syrtensis, Packard (1867). Mem. Boston Soc. Nat. Hist., vol. I, p. 288.

Tritonofusus syrtensis, Verrill (1882). Trans. Conn. Acad. Arts and Sc., vol. v, p. 511.

This species, which is based upon a single specimen "dredged on a shelly bottom in thirty fathoms, Square Island Harbour," Labrador, by Dr. Packard in 1864, may yet be discovered in the Gulf of St. Lawrence.)

Family *Fusidae*.

PTYCHATRACTUS LIGATUS (Mighels).

Fasciolaria ligata, Mighels and Adams (1842); and Gould (1870).

Ptychatractus ligatus, Stimpson (1865); et auct.

"Mingan, in the Gulf of St. Lawrence, taken from the stomachs of codfish, by Mr. Foster, fisherman, in summer of 1841" (Mighels and Adams).

The species has since been taken at the following Canadian localities: fishing banks off Halifax, "very rare" (Willis); Bay of Fundy, 15 to 60 fathoms (Verrill); Gaspé Bay, in 30 fathoms stones, one living adult specimen, dredged by the writer in 1871; Mingan, Foote (Verrill); and Murray Bay (Sir J. W. Dawson).

Sir J. W. Dawson, also, has obtained a "single mutilated specimen in the Pleistocene deposits at Montreal.

TOXOGLOSSA.

Family *Cancellaridae*.

ADMETE COUTHOUYI (Jay).

Cancellaria buccinoides, Couthouy (1838); non *C. buccinoides*, Sowerby (1832).

Admete Couthouyi, Jay (1839); and Gould (1841).

Admete crispa, Möller (1842).

Admete viridula, Stimpson (1863); non *Tritonium viridulum*, O. Fabricius (1780).

Throughout the entire region, at depths of from 10 to 60 fathoms. Specimens dredged by Sir J. W. Dawson at Métis are a little more than 21 milli-

metres in length. The species has been collected at four localities on the Labrador coast (where it occurs in a little shallower water) by the Stearns expedition in 1882; at Ashe Inlet, Hudson Strait, by Dr. R. Bell in 1884; and it had previously been recorded as a Greenland shell by Fabricius and Möller. It has also been collected in the Pleistocene deposits at the Chaudiere Station, near Quebec, and at Montreal.

According to Mörch & Dall, the original type of *Tritonium viridulum*, O. Fabricius, as well as the *Defrancia viridula* of Möller, both of which are founded on the same specimen in the Museum at Copenhagen, is a *Bela* like *B. exarata*, and not an *Admete*.

Family Turridæ.

Genus *Bela*, Leach.

The nomenclature of the *Belas* of this region has long been in a state of confusion, owing to the imperfect original descriptions and very inadequate illustrations of the New England and Greenland species, with which most of the Gulf of St. Lawrence forms are identical. In 1878, however, the Norwegian species were accurately figured by G. O. Sars, and more recently Professor Verrill and Miss Bush have made a special study of the North American *Belas*, and have kindly examined and determined all the Canadian species that the writer was able to send specimens of. In this list, therefore, the names of nearly all the species are given on their authority.

BELA NOBILIS (Möller).

Defrancia nobilis, Möller (1842).

Bela nobilis, Packard (1867).

A large living specimen dredged by the writer in 1871 on the north shore of the Gulf of St. Lawrence, off Egg Island, in 70–80 fathoms, has recently been identified with this species by Professor Verrill. The specimen is very nearly an inch in length. Packard, in 1867, had previously recorded the occurrence of *B. nobilis* on the Labrador coast, but states that it "differs from *B. Americana* and *B. turricula* (of which we would scarcely consider it a variety) in its fewer and larger rugæ, with less distinct revolving lines." The specimens from off Grande Grève, Gaspé Bay, that the writer referred to *B. nobilis* in 1869, Professor Verrill and Miss Bush think represent an at present undescribed species.

A considerable difference of opinion still exists among naturalists as to the distinctness or otherwise of certain real or nominal species of the *B. turricula* group. In his account of the Valorous Mollusca Jeffreys writes as follows, in regard to *B. turricula*:—"The sculpture is extremely variable.

Having before me a large number of specimens from various parts of the North Atlantic, and after a careful examination and comparison of types of several so-called species, both recent and fossil, I am convinced that the following must be considered synonyms of the present species: *Defrancia nobilis*, *scalaris* and *Woodiana* of Möller, *Tritonium roseum* of M. Sars, *Bela Americana* of Packard, and *Pleurotoma Dowsoni* and *robusta* of S. V. Wood. *P. harpularia* of Couthouy may be distinct, but it is questionable.*

Influenced no doubt by Jeffreys' opinion, Sir J. W. Dawson says that he includes under the name *B. turricula*—" *B. nobilis* of Möller; *B. Americana*, Packard; *B. scalaris*, Möller; *B. exarata*, Möller, Mörch; and *B. angulata*, Reeve." †

And, lastly, in his "Revision of British Mollusca," the Rev. Canon Norman quite recently quotes Jeffreys' views on this point, and adds the following comments on them. "I am myself inclined to regard *B. scalaris* and *B. nobilis* as forms of *turricula*; and, judging from Searles Wood's figures, *P. Dowsoni* and *robusta* are also referable to it. I would, moreover, include *B. exarata*, but hesitate as to *B. rosea*, and I doubt if the shell so called by Sars has been found in our seas, though Jeffreys records it from Oban." ‡

BELA SCALARIS (Möller).

Fusus turricula, Gould (1841); non Montagu, sp.

Defrancia scalaris, Möller (1842).

Bela Americana, Packard (1867); fide Verrill.

Bela turricula, Gould (1870).

Bela scalaris, G. O. Sars (1878).

"Not uncommon at Eastport, Me., and in the Bay of Fundy, where I dredged it in 1864, 1865, 1868, 1870, 1872, at various localities, in 10 to 90 fathoms. Halifax Harbour, 25 fathoms, and off Halifax, 59 to 100 fathoms, 1877. Labrador specimens were sent to me by Dr. A. S. Packard, jr., as *B. turricula* and *B. Americana*. This is our largest species of *Bela*. Its range is from off Cape Cod to Labrador, Greenland and northern Europe" (Verrill, 1882; Trans. Conn. Acad. Arts and Sc., vol. v., p. 472). The specimens from off Grande Grève, Gaspé Bay, that have been referred to this species by the writer, are now regarded as small individuals of *B. harpularia*.

* Annals and Magazine of Natural History for April, 1877, Ser. iv., vol. xix., pp. 331 and 332.

† The Canadian Ice Age, p. 250.

‡ Annals and Magazine of Natural History for August, 1899, Ser. vii., vol. iv., p. 132.

BELA EXARATA (Möller).

Defrancia exarata, Möller (1842).*Bela exarata*, H. and A. Adams (1858); G. O. Sars (1878); et auct.

"Seal Cove, Grand Manan Island, 5 to 8 fathoms (8 specimens) H. E. Webster, 1872. Halifax Harbour, stations 72, 73, in 18 fathoms, 1877. U. S. Fish Commission" (Verrill, 1882; op. cit. p. 468).

Off Grande Grève, Gaspé Bay, dredged by the writer in 1867. "Common along the whole coast" of Labrador (Packard). "Three were dredged at L'Anse au Loup" (on the north side of the Strait of Belle Isle) "with sand and kelp" by the Stearns' expedition, according to Miss Bush.

BELA CONCINNULA, Verrill.

Bela exarata, Verrill (pars); 1880.*Bela concinnula*, Verrill (1882).

"Halifax Harbour, 16 to 21 fathoms; and off Halifax, 42 fathoms, 1877. The specimens from Labrador were sent as *B. exarata* by Dr. A. S. Packard, jr. This shell is closely allied to *Bela exarata*, and may ultimately prove to be only a variety of the latter, as I formerly supposed, but it differs much in appearance from the form that I have described as the true *B. exarata*. The spire is much longer; the whorls are flatter and more regularly turreted, with more regular nodules on the shoulder; the ribs are smaller, more regular and more numerous; the spiral cinguli are more numerous, and so nearly equal to the ribs as to produce a very regular cancellation; the aperture is larger and longer, with a narrower and decidedly longer canal."

"The shell figured by G. O. Sars as *B. exarata* strongly resembles this species in general form and sculpture, and in the uncini, but it has a shorter aperture and a wide, open canal, very unlike that of our shell. Whether Sars' shell is identical with the true *B. exarata* is doubtful, for that was described as having a short spire, while his shell has a long spire" (Verrill, 1882; op. cit., pp. 469 and 470).

The Rev. Canon Norman, in the fourth part of his recent "Revision of British Mollusca," * places *B. concinnula* among the synonyms of *B. exarata*.

BELA MITRULA (Loven).

Tritonium mitrula Loven (1846).*Bela mitrula*, G. O. Sars (1878).*Bela concinnula*, var. *acuta*, Verrill (1882).

"Several specimens, agreeing closely with those of Europe, sent by Dr. Friele, were found at Forteau Bay, 20 fathoms, and L'Anse au Loup, 10 to

* Annals and Magazine of Natural History for August, 1890, Ser. VII, vol. IV., p. 132.

15 fathoms"—on the north side of the Strait of Belle Isle, by the Stearns expedition (Miss Bush). But *B. mitrula* is also included among the synonyms of *B. exarata* by the Rev. Canon Norman.

BELA WOODIANA (Möller).

Defrancia Woodiana, Möller (1842).

Bela Woodiana, Packard (1867).

Coast of Nova Scotia (Verrill); Salmon Bay, Caribou Island, in 15 fathoms (Packard).

"*Defrancia Woodiana*, Möller, from Greenland, has been considered as identical with *Bela harpularia* (Couthouy) by several authors. Möller's description is of no value. I have seen no Greenland examples of *B. harpularia*, and as it becomes decidedly rarer to the northward, on our coast, its occurrence at Greenland seems to me doubtful. It becomes comparatively rare in the Bay of Fundy and off Nova Scotia, where it is mostly replaced by *B. cancellata*, *B. scalaris*, and other more arctic forms. A somewhat similar shell, which I have identified as *B. Woodiana*, occurs on the coast of Greenland, from whence I have specimens, and on the coast of Nova Scotia; this is probably the Greenland shell that has been taken for *B. harpularia* by various writers." The shells described and figured by Prof. G. O. Sars as *B. harpularia* and its variety, *rosea*, do not appear to me to be identical with the true *B. harpularia*. "His shell has a different aperture, the whorls are more decidedly and squarely shouldered, and the ribs fewer and more distant. It is possibly the shell mentioned above as probably *B. Woodiana*" (Verrill, 1882; op. cit., pp. 474 & 475.)

BELA HARPULARIA (Couthouy).

Fusus harpularius, Couthouy (1838); and Gould (1841).

Bela harpularia, H. and A. Adams (1858); and Gould (1870); non G. O. Sars.

According to Professor Verrill "this species ranges from Long Island Sound to Nova Scotia, but is less common northward. It becomes comparatively rare in the Bay of Fundy and off Nova Scotia, where it is mostly replaced by *B. cancellata*, *B. scalaris* and other more arctic forms." Professor Verrill also says that it has been taken by the U. S. Fish Commission at Eastport, Me., and in the Bay of Fundy, in from 10 to 50 fathoms in 1870 and 1872; at Halifax harbour, N.S., in 20 fathoms, and off Halifax, 190 fathoms, in 1877; and by Smith and Harger, on the Bache in 1872, on the Le Have Bank, N.S. As already stated, the specimens dredged off Grande Grève and formerly referred to *B. scalaris* by the writer, have been

identified with *B. harpularia* by Professor Verrill. In the writer's judgment, also, most if not all of the specimens referred to *B. harpularia* by Sir J. W. Dawson, in his list of Pleistocene fossils in the "Canadian Ice Age," are the shell now called *B. cancellata*, var. *Canadensis*, by Professor Verrill and Miss Bush.

BELA ROSEA, Sars.

Bela harpularia, var. *rosea*, G. O. Sars (1878).

Bela rosea, Verrill (1882).

"Halifax Harbour, 15 to 20 fathoms; off Halifax, nine miles, 57 fathoms; U.S. Fish Commission, 1877" (Verrill, who, however, regards it, with *B. elegans* and *B. angulosa*, as species that are "still doubtful"). Forteau Bay, 20 fathoms; L'Anse au Loup, 10 fathoms; Henley Harbour, 10 to 15 fathoms; Temple Bay, 10 fathoms; and Dead Island, near Square Island, Labrador, 2 to 4 fathoms; Stearns expedition (Miss Bush).

BELA ANGULOSA, Sars.

"From Principal J. W. Dawson I have received a shell dredged by him off Métis, mouth of the St. Lawrence River, which agrees very closely with Sars' description and figure of this species" (Verrill, 1882; op. cit., p. 486).

BELA GOULDII, Verrill.

? *Bela rugulata*, G. O. Sars (1878); non Reeve.

Bela rugulata, Verrill (1880).

Bela Gouldii, Verrill (1882).

"Taken by the U.S. Fish Commission at Halifax Harbour and Bedford Basin, in 16 to 41 fathoms, 1877. "I have seen no specimen from further north" (Verrill, 1882; op. cit., p. 466). Quite recently, however, Professor Verrill has recognized a single specimen of a variety of *B. Gouldii*, among specimens dredged by the writer off Grande Grève, Gaspé Bay, in 1867.

BELA PINGELII (Möller).

Defrancia Pingelii, Möller (1842).

Bela Pingelii, H. and A. Adams (1858); G. O. Sars 1878; et auct.

"One specimen was dredged by Messrs. S. I. Smith and O. Harger, of the United States Fish Commission, in 1872, on Le Have Bank, off Nova Scotia, in 45 fathoms." "It appears to be a very rare species, however, and none of my specimens have the animals preserved" (Verrill, 1882; op. cit., p. 465). The occurrence of this species in Canadian waters, on the authority of Jeffreys, had previously been recorded in the Canadian

Naturalist and Geologist for March, 1870. The specimen sent to Dr. Jeffreys was dredged by the writer off Grande Grève, Gaspé Bay, in 1867 or 1869.

BELA CANCELLATA (Mighels).

Fusus cancellatus, Mighels (1841).

Bela cancellata, Stimpson (1860); and Gould (1870); but not of G. O. Sars.

Grand Manan, dredged alive in 25 fathoms, shelly bottom, off Duck Island (Stimpson). Bay of Fundy; off Nova Scotia; and Square Island, Labrador,—sent by Dr. A. S. Packard, jr., as *B. Vahllei*, *B. cancellata*, and *B. pyramidalis* (Verrill, 1882; op. cit., p. 476).

BELA CANCELLATA, var CANADENSIS, Verrill and Bush, M.S.

Specimens that Professor Verrill and Miss Bush have recently identified with this variety of *B. cancellata*, were dredged by the writer between Pictou Island and Cape Bear, and by Sir J. W. Dawson at Little Métis and Murray Bay. Some of these specimens are fully an inch in length. Similar specimens appear to have been referred to *B. harpularia* by Sir J. W. Dawson in his list of Pleistocene fossils in the Canadian Ice Age. Under that name this shell is cited as occurring also (recent) at Rivière du Loup and Kamouraska; and (fossil) at River Charles, &c., N.B.; Rivière du Loup, Murray Bay, Quebec, Montreal; and Labrador.

Professor Verrill states that *B. scalaris* is the largest species of *Bela* on the coast of New England, but in the Gulf and mouth of the River St. Lawrence *B. cancellata*, var. *Canadensis*, and *B. nobilis* (as recently identified by Verrill and Miss Bush) are by far the largest species known to the writer.

BELA SARSI, Verrill.

Bela cancellata, G. O. Sars, (1878); non Mighels.

Bela Sarsi, Verrill (1880).

"Several specimens dredged at Forteau Bay, 20 fathoms, L'Anse au Loup, 10 to 15 fathoms, have been directly compared with shells from Tromsø sent by Dr. Friele from the museum at Bergen. This is a rare species on the American coast, having been rarely found before, except at Murray Bay, Canada," by Sir J. W. Dawson (Miss Bush, in list of the mollusca, etc., of the Stearns exploring expedition).

BELA DECUSSATA (Couthouy).

Pleurotoma decussata, Couthouy (1839).*Bela decussata*, Gould (1870); et aliet.

Grand Manan (Stimpson). "Martha's Vineyard to Labrador. In the Bay of Fundy, where it is not rare, I have taken it in 20 to 100 fathoms, in 1868, 1870 and 1872. It has been dredged by the U.S. Fish Commission parties in Halifax harbour and off Nova Scotia, 15 to 59 fathoms, 1887" (Verrill, 1882; op. cit., p. 488). Probably common in the Gulf of St. Lawrence, though the Gaspé Bay specimens that were referred to *B. decussata* many years ago, by the writer, are the since described *B. incisula*. North shore of the Strait of Belle Isle at "Forteau Bay, 20 fathoms; L'Anse au Loup, 10 fathoms. One unusually large dead specimen at Henley Harbour," Labrador, "10 to 15 fathoms," Stearns' expedition (Miss Bush).

BELA INCISULA, Verrill.

1882. Trans. Conn. Acad. Arts and Sc., vol. v., p. 461.

Apparently the commonest of the smaller *Belas* in the Gulf of St. Lawrence. It had previously been identified by Packard and the writer with *B. decussata*, on account of its close correspondence with Gould's description and figure (185) of *Pleurotoma decussata* in the first edition of the "Invertebrata of Massachusetts." Tryon, too, in his monograph of the Pleurotomidæ, published in 1884, in the sixth volume of his Manual of Conchology, says that *B. incisula* appears to him to be "no more than a stunted shouldered variety" (of *B. decussata*) "with straight ribs, approaching *B. Kobelti*."

Verrill says that he has dredged *B. incisula* at Eastport Harbour and the Bay of Fundy, at many localities, in 5 to 110 fathoms, in 1864-72; at Halifax Harbour, in 16 to 21 fathoms, and off Nova Scotia, in 42 fathoms, in 1877. The writer has dredged it in Northumberland Strait, off Shediac, N.B., in 1873; off Grande Grève, Gaspé Bay, in 1867 and 1869; and elsewhere in the Gulf of St. Lawrence in 1871-73. Verrill states that it was sent to him, as from Labrador, mixed with *B. exarata* (= *B. concinnula*) by Packard; and Miss Bush records it as having been taken at four localities on the Labrador coast by the Stearns expedition in 1882.

It may be that the shells referred to *B. Trevelyana* by Sir J. W. Dawson, on page 250 of the "Canadian Ice Age," are all *B. incisula*, in which case the latter has also been found (living) at Little Métis, Rivière du Loup, and Murray Bay; and (fossil) in the Leda clay of Rivière du Loup and Labrador.

BELA IMPRESSA, Beck.

A specimen which has been identified with this species by Jeffreys in 1870, and by Verrill and Miss Bush in 1898 or 1899, was dredged by the writer off Grande Grève, Gaspé Bay, in 1867 or 1869.

BELA PLEUROTOMARIA (Couthouy).

Fusus pleurotomarius, Couthouy (1838).

Fusus rufus, Gould (1841); non Montagu.

Mangelia pyramidalis, Stimpson (1851).

Bela pleurotomaria, H. and A. Adams (1858).

Bay of Fundy, in 15 to 80 fathoms; and Halifax Harbour, in 20 to 25 fathoms (Verrill, who says that the species is found off Martha's Vineyard to Labrador). Fishing banks off Sable Island (Willis). Between Cape Bear, P.E.I., and Pictou Island, N.S. (Whiteaves). Gulf and mouth of the River St. Lawrence, at Gaspé Bay, Rivière du Loup, Murray Bay, and Kamouraska (Sir J. W. Dawson); and at Salmon Bay, near Caribou Island (Packard). Labrador coast, at Square Island, in 30 fathoms, and Sandwich Bay, in 4 fathoms (Packard); at L'Anse au Loup, in 10 to 15 fathoms; Henley Harbour, in 10 to 15 fathoms; Temple Bay, in 10 fathoms; and Dead Island, near Square Island, in 1 to 4 fathoms; Stearns expedition, (Miss Bush).

Fossil in the Leda clay at Montreal (Sir J. W. Dawson).

BELA BICARINATA (Couthouy).

Pleurotomaria bicarinata, Couthouy (1839).

Bela bicarinata, G. O. Sars (1878).

Variety VIOLACEA (Mighels and Adams).

Pleurotoma violacea, Mighels and Adams (1841).

Bela violacea, H. and A. Adams (1858).

Throughout the whole region, but apparently rather sparingly distributed. Verrill says that this species ranges from Cape Cod to Labrador, from low-water mark to 100 fathoms, and that he dredged both forms in Eastport harbour and the Bay of Fundy, in 10 to 50 fathoms, in 1864, 1868 and 1870. Willis records the occurrence of the var. *violacea* on the fishing banks off Sable Island; and Smith and Harger dredged the same variety on the Le Have Bank, in 45 fathoms, on the U. S. Fish Commission SS. Bache, in 1872. Both forms were taken by the U. S. Fish Commission parties in 1877, in Halifax Harbour, in 16 to 33 fathoms; and the Gloucester fishermen have brought it in from the banks off Nova Scotia (Verrill). In the Gulf and mouth of the River St. Lawrence, both forms have been dredged

in Northumberland Strait, off Grande Grève, Gaspé Bay, and off Cap Bon Ami (P.Q.), by the writer; at Ruisseau de la Grande Vallée, by Bell; at Little Métis, Rivière du Loup, and Murray Bay, by Sir J. W. Dawson; and at Salmon Bay, near Caribou Island (in 15 fathoms) by Packard. It is said to be found along the whole coast of Labrador, and to have been dredged at Square Island in 30 fathoms, on a shelly bottom, by Packard. The typical form was dredged by the Stearns expedition at Forteau Bay, 20 fathoms; L'Anse au Loup, 10 to 15 fathoms; and Henley Harbour, 10 to 15 fathoms; while the var. *violacea* is said to be common at all of the localities examined by the expedition, in from 1 to 20 fathoms (Miss Bush).

Fossil in the Leda clay at Montreal (Sir J. W. Dawson).

Verkrutzen (in 1878) records "*Bela turricula*, Mont., var. *nobilis*, Möller;" *Bela harpularia*, Couthouy; *Bela pyramidale*, Ström (*B. pleurotomaria*, Stimpson); *Bela Beckii*, Möller; and *Bela Trevelyana*, Turton;—as occurring at Annapolis Basin, N.S.; and describes, from that locality, three new species, which he calls *B. Gilpini*, *B. multicostata*, and *B. undata*.*

OPISTHOBRANCHIATA.

TECTIBRANCHIATA.

Family *Philinidae*.

PHILINE LIMA (Brown).

Utriculus lima, Brown (1827).

Bulla lineolata, Couthouy (1839); and Gould (1841).

Philine lineolata, Stimpson (1860); and Gould (1870).

Philine lima, G. O. Sars (1878); and Pilsbry (1895).

Grand Manan, "common in the shallows among the lower islands" (Stimpson). Fishing banks off Halifax, rare (Willis). Gulf of St. Lawrence, at Gaspé Bay (Sir J. W. Dawson); and near Caribou Island, just inside of the Strait of Belle Isle, in 10 to 15 fathoms, sand (Packard).

Rare in the Leda clay of Montreal (Sir J. W. Dawson).

PHILINE QUADRATA, Searles Wood.

Philine quadrata, S. Wood (1839); and Stimpson (1860).

Philine formosa, Stimpson (1850).

Fishing banks off Halifax, rare (Willis). In the Gulf of St. Lawrence a few specimens were dredged by the writer in 1871 and 1873, in deep water (180 to 220 fathoms), to the north, south, and south-east of the Island of Anticosti.

* Jahrbucher der Deutschen Malakozoologischen Gesellschaft, vol. v.

PHILINE FINMARCHICA, M. Sars.

Philine Finmarchica (M. Sars) G. O. Sars (1878) ; teste Verrill (1882).

Dredged by the U. S. Fish Commission in 1877, off Cape Sable, Nova Scotia, in 90 fathoms, fine sand (Verrill).

PHILINE FRAGILIS, G. O. Sars.

Philine fragilis, G. O. Sars (1878) ; and Verrill (1882).

With the preceding.

PHILINE CINGULATA, G. O. Sars.

Philine cingulata, G. O. Sars (1878) ; and Verrill (1882).

Taken by the U.S. Fish Commission in 1877, with the two preceding species (Verrill).

Family *Akeridae*.

HAMINEA SOLITARIA (Say).

Bulla solitaria, Say (1822) ; et auct.

Bulla insculpta, Totten (1835).

Haminea solitaria, Whiteaves (1874) ; et auct.

Beach at Pointe du Chêne, Shediac Bay, N.B., collected by the writer in 1873.

According to Sir J. W. Dawson, it is rather common in the Leda clay at Montreal.

Family *Scaphandridæ*.

SCAPHANDER PUNCTOSTRIATUS (Mighels).

Bulla puncto-striata, Mighels and Adams (1841 and 1842).

Scaphander librarius, Loven (1846).

Scaphander puncto-striata, Stimpson (1860).

Scaphander puncto-striatus, Gould (1870).

Fishing banks off Halifax (Willis). Gulf of St. Lawrence, about half way between Cap des Rosiers and the S.W. Point of Anticosti, in 200 fathoms mud, one living specimen, an inch and an eighth long, dredged by the writer in 1872.

DIAPHANA DEBILIS (Gould).

Bulla hyalina, Turton (1834), teste Jeffreys; non Gmelin (1792).

Bulla debilis, Gould (1840).

Akera subangulata, Möller (1842); teste Pilsbry.

Bulla pellucida, Brown (1844).

Amphiphyra pellucida, Loven (1846).

Diaphana debilis, Stimpson (1860); and Gould (1870).

Amphiphyra debilis, Verrill (1882).

Grand Manan, "taken alive in 6 fathoms, coarse sand, off Duck Island moorings" (Stimpson). "Not uncommon in Casco Bay and Bay of Fundy, and northward, in 6 to 50 fathoms" (Verrill). Fishing banks off Halifax (Willis). Gaspé Bay (but specimens very small and identification doubtful); and north shore of the Gulf of St. Lawrence, at Trinity Bay, in 25 fathoms, sand (Whiteaves).

Fossil in the Leda clay at Montreal (Sir J. W. Dawson).

DIAPHANA HIEMALIS (Couthouy).

Bulla hiemalis, Couthouy (1830).

Diaphana hiemalis, Stimpson (1860).

Amphiphyra hiemalis, Verrill (1879).

Grand Manan, "in forty fathoms mud, off Long Island" (Stimpson).

CYLICHNA ALBA (Brown).

Volvaria alba, Brown (1827).

Bulla triticea, Couthouy (1830); and Gould (1845).

Bulla corticata (Beck) Möller (1842).

Cylichna alba, Loven (1846); et auct. subsequ.

Bulla nucleola, Reeve (1855).

Cylichna alba, var. *corticata*, G. O. Sars (1878).

Throughout the whole region, and northward, at depths of from 2 to 60 fathoms. Stimpson says that this shell is common at Grand Manan, Verrill has taken it in the Bay of Fundy, Ganong in Passamaquoddy Bay, Verkruzen in Annapolis Basin, and Willis on the Atlantic coast of Nova Scotia. The writer has dredged specimens of the var. *corticata* at many localities in the Gulf of St. Lawrence, and Packard at Caribou Island. On the Labrador coast the ordinary form of the species has been dredged by Packard in Château Bay and Sloop Harbour, and, according to Miss Bush, by the Stearns expedition, at Dead Island, near Square Island.

It has long been known to occur on the coast of Greenland and Norway.

As a fossil, *C. alba* has been found in the Leda clay at Rivière du Loup, Montreal, and in the Pleistocene deposits of the Clyde, Scotland (Sir J. W. Dawson).

(CYLICHNA OCCULTA (Mighels and Adams).

Bulla occulta, Mighels and Adams (1841 and 1842); and Gould (1870).

Bulla Reinhardi (Holböll) Möller (1842).

Cylichna occulta, H. and A. Adams (1858); and Verrill (1879).

Cylichna Reinhardi, Leche (1878).

Coast of Labrador (Packard). "Norway, Spitzbergen and Greenland, south to Maine" (Pilsbry), though it has not yet been found inside of the limits embraced within the scope of this paper.)

Family Tornatinidae.

RETUSA PERTENUIS (Mighels).

Bulla pertenuis, Mighels (1843).

Utriculus pertenuis, Stimpson (1860); Gould (1870); et auct.

Diaphana pertenuis, Verrill (1872).

Retusa pertenuis, Pilsbry (1893).

Grand Manan, "in 10 fathoms sand, off Cheney's Head" (Stimpson). Fishing banks off Halifax, rare (Willis). Northumberland Strait, and Gaspé Bay (Whiteaves). Vicinity of Belles Amour, P.Q., just inside of the Strait of Belle Isle, in 8 fathoms muddy bottom (Packard).

Fossil in the Leda clay of Montreal (Sir J. W. Dawson).

RETUSA NITIDULA (Loven).

Cylichna nitidula, Loven (1846); et auct.

Utriculus nitidulus, G. O. Sars (1878).

Diaphana nitidula, Verrill (1880 and 1882).

Retusa nitidula, Pilsbry (1893).

A few living specimens of a shell that Professor Verrill has identified with this species, were dredged by the writer in 1872 and 1873, in the Gulf of St. Lawrence about half-way between the south shore of the Island of Anticosti and the Gaspé peninsula, in 200 fathoms, mud. They had previously and provisionally been referred to the very similar *Cylichna umbilicata* (Montagu) of which *C. strigella*, Loven, is a synonym.

RETUSA GOULDII (Couthouy).

Bulla Gouldii, Couthouy (1839); and Gould (1841).

Utriculus Gouldii, Stimpson (1860); and Gould (1870).

Cylichna Gouldii, Verrill (1880).

Utriculus (Retusa) Gouldii, Dall (1889).

Retusa Gouldii, Pilsbry (1893).

Annapolis Basin, N.S., seldom (Verkruzen).

TORNATINA CANALICULATA (Say).

Volvaria canaliculata, Say (1822).

Bullina canaliculata, Say (1832).

Bulla obstricta, Gould (1840).

Bulla canaliculata, Gould (1841).

Tornatina canaliculata, A. Adams (1850); Verrill (1879); et auct.

Utriculus canaliculatus, Stimpson (1860); and Gould (1870).

South coast of Prince Edward Island (F. Bain); occasionally at Summerside, P.E.I.; and Cocagne, N.B., one specimen (Rev. W. H. Winkley).

NUDIBRANCHIATA.

Family *Hermæidæ*.

ALDERIA HARVARDIENSIS (Agassiz).

Canthopsis Harvarliensis, Agassiz (1850); and Stimpson (1853);
but in each case with no description.

Alderia Harvardiensis, Gould (1870); with description and figures.

Grand Manan Island, "very common in sheltered muddy bays in this region, feeding on filamentous chlorosperms about low-water mark" (Stimpson).

Family *Dotoidæ*.

DOTO CORONATA (Gmelin).

Doris coronata, Gmelin (1792).

Doto coronata, Loven (1846); et auct.

Near Duck Island, Grand Manan, on rocks in 15 fathoms (Stimpson).

DOTO FORMOSA, Verrill.

1875. Amer. Journ. Sc. and Arts, Third Series, vol. x., p. 41.

"I took this species at Eastport, Maine, and on the coast of Nova Scotia in 1861" (Verrill, 1882).

Family *Æolidæ*.

ÆOLIS PAPILLOSA (L).

Limax papillosus, L. (1767).

Doris papillosa, O. F. Müller (1776); and O. Fabricius (1780).

Æolidia Bodoensis, Möller (1842).

Æolis farinacea, (Gould M. S.) Stimpson (1853); and Gould (1870).

Grand Manan, "very numerous, spawning on the rocks above low-water mark in August" (Stimpson). Very common in the Bay of Fundy from

above low-water mark to 20 fathoms (Verrill). As the species is known to occur on the coast of Greenland it is probably also a native of the Gulf of St. Lawrence.

ÆOLIS STELLATA, Stimpson.

Eolis stellata, Stimpson (1853).

Æolis stellata, Stimpson (1860); and Gould (1870).

Grand Manan, "found under stones at low-water mark, and when disturbed rolls itself up so that its branchiæ project in all directions like the rays of a star" (Stimpson).

ÆOLIS PURPUREA, Stimpson.

Eolis purpurea, Stimpson (1853).

Æolis purpurea, Gould (1870).

Grand Manan, "found at Duck Island, under stones, at low-water" (Stimpson).

CORYPHELLA DIVERSA (Couthouy).

Eolis diversa, Couthouy (1838).

Æolis diversa, Stimpson (1860); and Gould (1870).

Coryphella diversa (Couthouy) Verrill (1879).

Grand Manan, "in four fathoms on *Laminaria*" (Stimpson); L'Anse au Loup, two specimens, Stearns expedition (Miss Bush).

CORYPHELLA MANANENSIS (Stimpson).

Eolis Mananensis, Stimpson (1853).

Æolis Mananensis, Stimpson (1860).

Coryphella Mananensis, Verrill (1880).

Grand Manan, in 35 fathoms, on a gravelly bottom in the Hake Bay (Stimpson). "This species sometimes occurs at low-water mark at Eastport, Me., and Grand Manan, but it is usually an inhabitant of rather deep water, on rocky bottoms. We have dredged it at many localities from off Fisher's Island and Black Island to Halifax, N.S., in 20 to 90 fathoms, among hydroids. It is the most common species at such depths" (Verrill, 1882; Trans. Conn. Acad. Arts. and Sc., vol. v., pp. 552 and 553).

CORYPHELLA STIMPSONI, Verrill.

Cuthona Stimpsoni, Verrill (1879).

Coryphella Stimpsoni, Verrill (1890).

"This species occurs from Massachusetts Bay and Salem Harbour, Mass., to Halifax, Nova Scotia; and from low-water at Eastport, Me., to 51 fathoms at Jeffreys' Ledge" (Verrill, 1882; op. cit., p. 552).

Family *Dendronotidae*.

DENDRONOTUS ARBORESCENS (Müller).

Doris arborescens, O. F. Müller (1776); and O. Fabricius (1780).

Tritonia arborescens, Cuvier; and Gould (1845).

Tritonia Reynoldsii, Couthouy (1838).

Dendronotus arborescens (Alder and Hancock, 1850); Gould (1870).

Dendronotus Reynoldsii, Stimpson (1860).

Grand Manan. "Fine large specimens are taken at low water, and in all parts of the laminarian zone, on rocky bottoms." "The most common variety is white or colourless." "The ova were deposited in August" (Stimpson). Le Have Bank, N.S., in 45 fathoms, U.S. Fish Commission, 1872 (Smith and Harger); Halifax Harbour, 1877 (J. M. Jones). Strait of Belle Isle, 30 to 40 fathoms, (Dr. J. W. Deeks); Henley Harbour, Château Bay, Labrador, in 4 fathoms, 1864 (Packard).

DENDRONOTUS ROBUSTUS, Verrill.

Dendronotus robustus, Verrill (1870; also 1879 and 1883).

Dendronotus velifer, G. O. Sars (1878); fide Verrill.

The type of *D. robustus* is a single specimen found at "Whale Cove, Grand Manan, on sea weeds in a pool near low-water mark," by Mr. Oscar Harger in 1870, and Professor Verrill says that the species is now known to occur from "Vineyard Sound to Nova Scotia" from low-water mark to 98 fathoms. J. M. Jones, in his List of the Mollusca of Nova Scotia, cites the species as having been taken thirty miles south-east from Chebucto Head, N.S., in 110 fathoms.

Family *Polyceridae*.

POLYCERA LESSONII, Orbigny.

Polycera Lessonii, Orbigny (1837); and Gould (1870).

Doris illuminata, Gould (1841).

Polycera illuminata, Stimpson (1860).

Common in Casco Bay and Bay of Fundy, from low-water mark to 20 fathoms (Verrill).

ISSA LACERA (Müller).

Triopa lacer, Müller (non L.) teste Loven (1846); et auct.

Issa lacera, Bergh (1880); and Verrill (1882).

"Off Halifax, Nova Scotia, 90 to 92 fathoms," U. S. Fish Commission, 1877 (Verrill).

ANCUA SULPHUREA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 26.

Grand Manan, "very common under stones at low-water and in the laminarian zone" (Stimpson).

Family Doridæ.

DORIS PLANULATA, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 26.

Grand Manan (Stimpson); and "on stones at low-water, Passamaquoddy Bay, in July" (Gould). Stimpson says that it "differs but slightly from *D. repanda*, A. and H."

ONCHIDORIS MURICATA (Müller).

Lamellidoris muricata (Müller) G. O. Sars (1878).

Onchidoris muricata, Verrill (1882).

According to Verrill, "specimens dredged at many localities, in 3 to 21 fathoms, from Block Island to Halifax, Nova Scotia, appear to belong to this species."

ONCHIDORIS PALLIDA (Stimpson).

Doris pallida (Agassiz M. S.); Stimpson (1853); and Gould (1870).

Onchidoris pallida, Verrill (1870).

Grand Manan, "off the northern point of Duck Island, in 25 fathoms gravel" (Stimpson); common in the Bay of Fundy (Verrill).

"This species, if distinct from *Doris fusca*, Fabricius, and *D. diaphana*, Alder and Hancock, was first properly described, as well as figured, by Gould in 1870. All that Stimpson had previously said about it was that it is remarkable for the large size of the tubercles of the cloak" (Verrill). G. O. Sars, however, distinctly states that Stimpson's *Doris pallida* is a synonym of *O. muricata*, which he calls *Lamellidoris muricata*.

PULMONATA.

Family Auriculidæ.

MELAMPUS BIDENTATUS, Say.

Melampus bidentatus, Say (1822).

Auricula bidentata, Gould (1841).

Melampus corneus, Stimpson (1851).

Marsh on West or Elliot River, near Charlottetown, P.E.I.; (F. Bain, 1885).

ALEXIA MYOSOTIS (Draparnaud).

Auricula myosotis, Draparnaud.*Auricula denticulata*, Gould (1841); not Montfort.*Alexia myosotis*, Pfeiffer (1856).

Recorded by Willis, with a query, as common in Halifax Harbour.
 "Probably an imported species, as Stimpson remarks (Shells of New England) being found only in the Atlantic seaports" (Gould, second edition).

PTEROPODA.

THECOSOMATA.

Family *Limacinidae*.

LIMACINA GOULDII (Stimpson).

Spiralis Gouldii, Stimpson (1851).*Heterofusus balca* and *H. retroversus*, Binney* (1870); but, according to Verrill, not of European writers.*Limacina Gouldii*, Verrill (1879).

Two or three dead shells of this minute pteropod were dredged by the writer in 1872, in the deepest spot in the Gulf of St. Lawrence, about half-way between East Cape, Island of Anticosti, and the Bird Rocks, in 313 fathoms, black mud, with a few angular and rounded stones. Stimpson says that *S. Gouldii* occurs on the "whole coast of New England north of Cape Cod."

Verrill, in 1873, says that the "identity of this species with the *Limacina balea*, Möller, of Greenland, is very questionable." "The description of the latter is brief, and no mention is made of the spiral sculpture, which is an important character of *S. Gouldii*."†

On the other hand, Binney, in 1870, makes *S. Gouldii*, Stimpson, and *Limacina balea*, Möller, = *Heterofusus balea*, Mörch, and regards the latter as distinct from *H. retroversus* (Fleming); and G. O. Sars, in 1878, comes to the same conclusion.‡ Dr. Paul Pelseneer, in 1888,§ includes both *Spiralis Gouldii* and *Limacina balea* among the synonyms of *Heterofusus retroversus*, which he calls *Limacina retroversa*.

(*Limacina helicina* (Phipps) is recorded as having been taken abundantly off the Labrador coast by Packard in 1864 and by L. M. Turner in 1882, also in Hudson Strait; but it has not yet been found so far south as the Gulf of St. Lawrence.

* In the Second Edition of Gould's Report on the Invertebrata of Massachusetts, p. 505.

† U.S. Fish Commission, Report for 1871-72, p. 669.

‡ Mollusca Regionis Arcticæ Norvegiæ (Christiania), pp. 329 and 330.

§ H.M.S. Challenger Reports, Zoology, vol. XXIII, p. 27 and 28.

The types of *Psyche globulosa*, Rang, of the family Uymbulidæ, also, are from St. Pierre and Miquelon, off the south coast of Newfoundland, just outside of the area embraced by this paper.)

GYMNOSOMATA.

Family Clionidæ.

CLIONE LIMACINA (Phipps).

Clio limacina, Phipps (1774).

Clione papilionacea, Pallas (1774).

Clio retusa, O. F. Müller (1776); and O. Fabricius (1780).

Clio borealis, Bruguière (1792); et auct.

Clione limacina, Stimpson (1860); and G. O. Sars (1878).

Clione Miquelonensis, Rang (1825).

Near Caribou Island, P.Q., just inside of the Strait of Belle Isle, Packard, 1860; "seen frequently floating near the surface in calm weather." Strait of Belle Isle, surface, forming a large part of the food of herrings (Dr. J. W. Deeks). Taken by L. M. Turner "on the voyage to Ungava Bay in north latitude 56°, and west longitude 60°, off the Labrador coast, July 13, 1882, swimming at the surface" (Dall). The species has also been collected or observed from New York to Newfoundland, Hudson Strait, Davis Strait, Baffin Bay and Greenland.

CEPHALOPODA.

DIBRANCHIATA.

DECAPODA.

Family Taonoteuthi.

HISTIOTEUTHIS COLLINSII, Verrill.

1879. Amer. Journ. Sc. and Arts, Third Series, vol. xvii., p. 241.

1880. Trans. Conn. Acad. Arts and Sc., vol. v., p. 234.

1881. Idem, pp. 300, 404 and 431.

"Taken from the stomach of *Alepidosaurus ferox*, lat. 42° 49, long. 62° 57, off" (Banquereau), "Nova Scotia, by Capt. J. W. Collins and crew, of the schooner Marion, 1879. Western bank, off Nova Scotia," another specimen, "represented by the jaws alone" (Verrill; Trans. Conn. Acad. Arts and Sc., vol. v., pp. 238 & 300).

CHIROTEUTHIS LACERTOSA, Verrill.

1881. Trans. Conn. Acad. Arts and Sc., vol. v., p. 408.

"Brown's Bank, off Nova Scotia, taken from the stomach of a cod (lot 956). Presented to the U. S. Fish Commission by Capt. Wm. Dempsey and crew, of the schooner Clara F. Friend" (Verrill, op. cit., p. 411).

Family *Onychii*.

GONATUS FABRICII (Lichtenstein).

Sepia loligo, O. Fabricius (1780).

Onychoteuthis Fabricii, Lichtenstein (1818); and Möller (1842).

Gonatus Fabricii, Steenstrup (1880).

Lestoteuthis Fabricii, Verrill (1881).

"A young specimen of this species, in nearly perfect preservation, was recently presented to the U. S. Fish Commission by Capt. William Dempsey and crew, of the schooner Clara F. Friend. It was taken from the stomach of a cod off Seal Island, Nova Scotia" (Verrill; op. cit., p. 292).

Family *Ommastrephidae*.

(*Architeuthis Harveyi* (Kent) has been found at Logie Bay and Portugal Cove, near St. Johns, Newfoundland, and on the Grand Banks; and *A. princeps*, Verrill, at Catalina, Trinity Bay, Newfoundland, also on the Grand Banks; but as yet there is no satisfactory evidence of the occurrence of either off the coast of eastern Canada).

ILLEX ILLECEBROSUS (Lesueur).

Loligo illecebrosa, Lesueur (1821).

Ommastrephes illecebrosa, Verrill (1872).

Illex illecebrosus, Steenstrup (1880).

The "common squid" of the Gulf of St. Lawrence and Maritime Provinces, though, owing to its active mode of life, as a free swimmer, it is rarely (if ever) taken in the dredge. Living or fresh specimens, however, are not infrequently thrown on the beach by storms. Squids school in summer, like mackerel and herring, and are caught by the Gaspé fishermen by "jigging," and used as bait for cod. Kumlien says that this species occurs in Cumberland Gulf (Baffin Land); and Verrill (op. cit., p. 281) that "it extends as far south as Newport, R.I.," and that it is "very abundant in Massachusetts Bay, the Bay of Fundy and northward to Newfoundland."

OMMASTREPHES MEGAPTERUS (Verrill).

Architeuthis megaptera, Verrill (1878).*Sthenoteuthis megaptera*, Verrill (1880).*Ommastrephes megalopterus*, Steenstrup (1880).

The specimen upon which this species is based was "cast ashore, during a severe gale, near Cape Sable, Nova Scotia, and was secured for the Provincial Museum at Halifax by J. Matthew Jones, Esq. It is preserved entire, in alcohol, and is still in good condition."

"I refer, doubtfully, to this species, an entire beak, with the odontophore, presented by Capt. Geo. A. Johnson and crew, of the schooner A. H. Johnson. It was taken at Sable Island Bank, Nova Scotia, in 280-300 fathoms, Sept., 1878" (Verrill; op. cit., p. 227).

The "terminal part of a tentacular arm" of a specimen which Professor Verrill (op. cit., p. 193) thinks may also be referable to this species, was taken "from the stomach of a large and voracious fish (*Alepidosaurus ferox*)" caught on a halibut line off Banquereau, N.S., in 1879.

Family Sepiolini.

ROSSIA HYATTI, Verrill.

1878. Amer. Journ. Sc. and Arts, Third Series, vol. xvii., p. 208.

1880. Idem., Third Series, vol. xix., p. 291.

1881. Trans. Conn. Acad. Arts and Sc., vol. v., p. 351.

"Off Cape Sable, N.S., 82-92 fathoms; off Halifax, N.S., 57-100 fathoms, on a fine compact sand and mud bottom." "It has also been received through the Gloucester halibut fishermen, from the banks of Nova Scotia" (Verrill; op. cit., p. 353).

ROSSIA SUBLEVIS, Verrill.

1878. Amer. Journ. Sc. and Arts, Third Series, vol., xvi, p. 209.

1881. Trans. Conn. Acad. Arts and Sc., vol. v., p. 354.

Taken by the dredging parties of the U. S. Fish Commission, in 1877, in the trawl-net off Halifax, N.S., in 42 and 101 fathoms, fine sand. It has also been brought in by Capt. J. W. Collins and crew, of the schooner Marion, from the banks off Nova Scotia (Verrill; op. cit., p. 356).

Rev. Canon Norman, however, in the first part of his recent "Revision of British Mollusca," (published in the Annals and Magazine of Natural History for June, 1890) thinks that *R. sublevis* is not distinct from *R. glaucoptis*, Loven (1846).

ROSSIA (?) TENERA (Verrill).

Heteroteuthis tenera, Verrill (1880).*Rossia (?) tenera*, Hoyle (1886).

H. M. S. Challenger, Station 49 (May 20, 1873), south of Halifax, Nova Scotia, 85 fathoms, gravel and stones; one specimen.

(*Rossia megaptera*, Verrill, has been taken off the southern coast of Newfoundland, in 150 fathoms; but not yet, so far as the writer can learn, in the seas of eastern Canada.)

OCTOPODA.

Family *Octopodidae*.

OCTOPUS ARCTICUS, Prosch.

Octopus arcticus, Prosch (1849); fide Norman (1890).*Octopus Bairdii*, Verrill (1873).

Taken by the U. S. Fish Commission, in 1872, off Grand Manan Island, in 97-100 fathoms, and at three localities in the Bay of Fundy, in 60-80 fathoms; also in 1887, thirty miles off Cape Sable, N.S., in 91 fathoms, and twenty-three miles off Halifax, in 101 fathoms. "The Gloucester fishermen have brought in several specimens from the banks of Nova Scotia and Newfoundland" (Verrill; Trans. Conn. Acad. Arts and Sc., vol. v., pp. 370 and 371).

OCTOPUS PISCATORUM, Verrill.

1879. Amer. Journ. Sc. and Arts, Third Series, vol. xviii., p. 470.

1881. Trans. Conn. Acad. Arts and Sc., vol. v., p. 378.

"Le Have Bank, Nova Scotia, in 120 fathoms, taken by Captain John McInnis and crew, of the schooner M. H. Perkins, October, 1879," and presented to the U. S. Fish Commission (Verrill; op. cit., p. 378). One female.

OCTOPUS OBESUS, Verrill.

1880. Amer. Journ. Sc. and Arts, Third Series, vol. xix., p. 137.

1881. Trans. Conn. Acad. Arts and Sc., vol. v., p. 379.

"Taken from the stomach of a halibut, 36 miles east from the N.E. Light of Sable Island, in 160 to 300 fathoms, by Charles Ruckley, of the schooner H. A. Duncan, and presented by him to the U. S. Fish Commission, 1879. "A smaller, mutilated specimen was also taken from the stomach of a halibut, from Banquereau, off N.S., in 150 fathoms, (lot 678) and presented to the U. S. Fish Commission, by Captain Charles Markuson and crew, of the

schooner Notice, April, 1880. "The latter specimen was, however, in too poor condition to afford any additional characters, and may, perhaps, belong to *O. lentus*" (Verrill; op. cit., p. 380).

OCTOPUS LENTUS, Verrill.

1880. Amer. Journ. Sc. and Arts, Third Series, vol. xix., p. 138.

1881. Trans. Conn. Acad. Arts and Sc., vol. v., p. 375.

The first specimen of this species was taken off Nova Scotia, near Le Have Bank, in 120 fathoms, by Captain Samuel Peeples and crew of the schooner M. H. Perkins, and presented to the U. S. Fish Commission. "A few others have since been brought in by the Gloucester fishermen, from the Bank Fisheries. Mr. A. Agassiz dredged it on the 'Blake', in 1880, as far south as N. lat. 33° 42' 15". It ranges in depth from 120 to 602 fathoms" (Verrill; op. cit., p. 377).

Family *Pteroti*.

STAUROTEUTHIS SYRTENSIS, Verrill.

1879. Amer. Journ. Sc. and Arts, Third Series, vol. xviii., p. 468.

1881. Trans. Conn. Acad. Arts and Sc., vol. v., p. 382.

"The only known example of this remarkable species was taken by Capt. Melvin Gilpatrick and crew, schooner 'Polar Wave', in N. lat. 43° 54'; W. long. 58° 44', on Banquereau, about 3 miles E. of Sable Island, N.S., in 250 fathoms. Presented to the U. S. Fish Commission, Sept., 1879 (lot 472)" Verrill; op. cit., p. 384.

ARTHOPODA.

CRUSTACEA.

Series A. ENTOMOSTRACA.

CIRRHIPEDIA.

(RHIZOCEPHALA).

PELTOGASTER PAGUR?, Rathke.

Henley Harbour, Château Bay, Labrador, one specimen on *Eupagurus pubescens* from shallow water, Stearns expedition (S. I. Smith, who says that "Packard recorded the species from Maine, not Labrador").

(THORACICA.)

Family *Lepadidae*.

LEPAS FASCICULARIS, Ellis and Solander.

"Frequently taken in the Bay of Fundy in August" (Verrill, 1873).

In his 1863 "List of Nova Scotian Shells," Willis says that "*Anatifa vitrea*, Lam. (?) " has been found "about Sable Island;" and that *A. levis* is "common." Sir J. W. Dawson, also, in his Hand Book of Zoology, published in 1870, quotes *Lepas dentata*, Gould, as "common on the Atlantic coast." But, *Anatifa levis* is said to be a synonym of *Lepas anatifera*, L.; and *Lepas dentata*, of *L. pectinata*, Spengler.

SCALPELLUM STRCEMII, M. Sars.

H.M.S. Challenger, Station 49 (May 20, 1873), south of Halifax, Nova Scotia, dredged in 85 fathoms, gravel and stones.

Family *Balanidae*.

BALANUS IMPROVISUS, Darwin.

Nova Scotia (Darwin, 1841).

BALANUS BALANOIDES (L.)

Lepas balanoides, L. (1767); teste Darwin.

Balanus ovalaris, Gould (1841).

Balanus elongatus, Gould (1841).

Balanus balanoides, Stimpson (1853).

Grand Manan, "found abundantly, and generally of large size, on the rocks in the littoral zone. Several fine specimens were found attached to living examples of *Littorina littoralis*" (Stimpson). "Extremely abundant between tides. It inhabits the whole North Atlantic" (Verrill). Near Caribou Island (Packard).

BALANUS ORENATUS, Bruguière.

Balanus orenatus, Bruguière (1798); teste Darwin.

Balanus rugosus, Gould (1841).

Gaspé Bay, "common on stones near the shore" (Sir J. W. Dawson, 1858). "The common beach 'acorn shell,' which appears abundantly on all rocky coasts" (Sir J. W. Dawson, Hand Book of Zoology, 1870). "A common species, found along the whole coast" on the north side of the Strait of

Belle Isle, and of Labrador (Packard). Dr. Bell dredged specimens, that appear to be referable to this species, at Ashe Inlet, Hudson Strait, in 1884.

Sir J. W. Dawson (who says that "it seems to be *Lepas balænaris* of Fabricius") states that *B. crenatus* has been found fossil in the Pleistocene of Portland, Maine; of St. John, N.B.; of Anticosti, Rivière du Loup, Quebec and Montreal; of Labrador and Vancouver Island.

BALANUS PORCATUS, Da Costa.

Gaspé Bay, "on stones in 10 fathoms" (Sir J. W. Dawson, 1858). Near Caribou Island; and whole coast of Labrador, "found only in deep water" (Packard).

Fossil at Beauport, but much more rare in the Pleistocene of Canada than *B. Hameri*. *B. porcatus* is "no doubt *Lepas balanus* of Fabricius from Greenland" * (Sir J. W. Dawson).

BALANUS HAMERI, Ascanius.

"Coast of Nova Scotia. I have obtained specimens from Mr. Downes, of Halifax, but have not elsewhere seen the species recent. It is *B. Uddevallensis* of lists of Scandinavian fossils and *B. tulipa* of Möller. It is a widely diffused Arctic and North Atlantic species."

"Fossil—Montreal; St. Nicholas; Quebec; Anticosti; Rivière du Loup; also, Uddevalla; Russia (Murchison); Greenland (Spengler)."

"This Acorn-shell is very abundant at Rivière du Loup, and fine specimens are found entire, attached to stones and boulders in the boulder clay."

"Very fine specimens are also obtained at River Beaudette, about 34 miles west of Montreal. This locality is noteworthy as being further west than the others mentioned. The specimens are also interesting from their remarkable perfection and the large masses which they form, some of which contain as many as a dozen individuals attached to each other. They were collected by Mr. A. W. McNown, of Rivière Beaudette, and by Mr. Stanton, C.E., of Lancaster" (Sir J. W. Dawson).†

The names of *Balanus miser*, Lamarck, and *B. geniculatus*, Stimpson, are also included by Willis, in 1863, in his List of Nova Scotian Shells.

CORONULA DIADEMA, L.

Gaspé Bay, on skin of whales (Sir J. W. Dawson, 1858). "Sable Island, whale's back" (Willis, 1863). Near Caribou Island, on the grampus; and "taken quite frequently from the skin of whales caught in the Gulf of St. Lawrence" (Packard).

* The Canadian Ice Age, &c., p. 268.

† Idem, pp. 262 and 263.

CORONULA REGINA, Darwin.

"On shreds of the skin of the humpback whale in one of the whale houses" (in Gaspé Bay) "we found a specimen, which corresponds exactly with Darwin's description of this species, hitherto obtained only from the Pacific. It is full grown, being nearly two inches in diameter, and was imbedded nearly to the summit in the skin. It may be easily distinguished from the common whale barnacle, *C. diadema*, by its flattened form, its low and smooth ribs delicately marked with radiations and transverse ribs with minute tubercles at the intersections, and by the thinness of its radial plates. It would be interesting to know if this *Coronula* is peculiar to the humpback, which is very probably an Arctic species visiting both the Pacific and Atlantic" (Sir J. W. Dawson, in the Canadian Naturalist and Geologist for October, 1858).

COPEPODA.

LERNÆA BRANCHIALIS, L.

Lernæa branchialis, L.; et auct.

Lernæa branchialis, var. *sigmoidea* (Steenstrup and Lutken)

S. I. Smith (1883).

A few specimens that Stimpson referred to this species, with a query, were "found fixed in the flesh of the neck in young cod-fishes" at Grand Manan; and Verrill says that *L. branchialis* is "found attached to the gills of the cod, in the Bay of Fundy."

Professor S. I. Smith says that one specimen of the var. *sigmoidea*, without special locality, is among the specimens obtained by the Stearns expedition. Packard, he adds, gives no special locality for his specimens, and says that they were "attached to the skin of the codfish, which makes it almost certain that he observed some entirely different parasite."

CALIGUS CURTUS, Müller.

Caligus curtus, Müller (1785); et auct.

Caligus Americanus, Pickering and Dana (1838).

"Abundant upon the codfish of our coast and of Europe. It is probably the *Caligus piscinus* of Gould and other American writers," which Stimpson says is "found in great abundance on the surface of the halibut" at Grand Manan; S. I. Smith (Verrill, 1873; Rep. U. S. Fish Comm. for 1871-1872, p. 575).

ARGULUS. (Species undetermined.)

On *Gasterosteus* and other small fishes taken in a towing net off Pictou Island, N.S., by the writer in 1873.

IRENÆUS PATERSONI, Templeton.

Several specimens of a small copepod, taken by the writer in a towing net in the Gulf of St. Lawrence, in 1873, were identified with this species by Professor S. I. Smith.

Other specimens of a copepod, taken by the writer in a towing net, near the Magdalen Islands and at other localities in the Gulf of St. Lawrence, have been supposed to be referable to the *Calanus Finmarchicus* of Gunner, of which the *Cetocheilus septentrionalis*, Baird, is a synonym.

OSTRACODA.

The following species, dredged in the Gulf of St. Lawrence by Sir J. W. Dawson, the writer, and others, up to 1869, were identified by Mr. G. S. Brady, and recorded by him in the Annals and Magazine of Natural History for December, 1870, and in the fifth volume of the Second Series of the "Canadian Naturalist."

Argilloecia, sp.

Cythere leioderma, Norman.

- " lutea, Müller.
- " pellucida, Baird.
- " emarginata, Sars, sp.
- " concinna, Jones.
- " tuberculata, Sars.
- " Canadensis, nov. sp.
- " villosa, Sars.
- " Dunelmensis, Norman, sp.
- " Dawsoni, nov. sp.
- " abyssicola, Sars, sp.
- " ? Whitei, Baird, sp.
- " costata, Brady.

Cytheridea papillosa, Bosquet.

Cytheridea punctillata, Brady.

- " Sorbyana, Jones.
- " (?) elongata, Brady.

Eucythere Argus, Sars, sp.

Loxococoncha, sp.

Nestoleberis depressa, Sars.

Cytherura undata, Sars (var.).

- " pumila, C., B., and R. (M.S.).

- " (?) concentrica, C., B., & R. (M.S.).

Cytheropteron nodosum, Brady.

Bythocythere turgida, Sars.

Cytherideis foveolata, nov. sp.

Philomedes interpuncta, Baird, sp.

Bradycinetus, sp.

The writer's subsequent dredgings in 1871-72-73 added many more specimens of the foregoing, and the following additional species, as identified subsequently by Mr. Brady and Mr. David Robertson.

Cythere limicola, Norman.

- " badia ? Norman.

Krithe (Ilyobates) Bartonensis, Jones.

Cytherura Sarsii ? Brady.

- " cristata, Brady and Crosskey.

Cytheropteron arcuatum, Br. and Rob.

- " angulatum, Br. and Rob.

- " vesportilio ? Reuss.

Sclerochilus contortus, Norman.

Of these, *Cythere Dawsoni*, *Cytheridea papillosa*, *C. punctillata*, *C. Sorbyana*, and *Eucythere Argus*, have also been found fossil in the Leda clay of Montreal.

The types of the recent *Cypridina excisa*, Stimpson, are from Grand Manan, among nullipores in 4 or 5 fathoms, and specimens that are supposed to be referable to this species have been dredged in the Gulf of St. Lawrence by the writer, and on the Labrador coast by Packard.

Series B. MALACOSTRACA.

LEPTOSTRACA (OR PHYLLOCARIDA).

NEBALIA BIPES (Fabricius).

Cancer bipes, O. Fabricius (1780).*Nebalia bipes*, Packard (1867).

Specimens that have been identified with this species by Professor S. I. Smith, were dredged by the writer on the Bradelle Bank, and about half way between Anticosti and the Gaspé peninsula, in 220 fathoms, in 1873. Packard had previously dredged *N. bipes* at Henley Harbour, Strait of Belle Isle, "at a depth of 4 to 8 fathoms."

ARTHROSTRACA.

AMPHIPODA.

Thirty-three species of Amphipoda are enumerated or described in Stimpson's "Synopsis of the Marine Invertebrata of Grand Manan," published in the sixth volume of the Smithsonian Contributions to Knowledge. The nomenclature of these species has since been reviewed at some length and revised, by the Rev. Thomas R. R. Stebbing, on pages 276-79 of the first half of the text of his Report (Zoology, vol. xxix.) on the Amphipoda obtained by H.M.S. Challenger. Twenty-five species of Amphipoda are recorded or described by Packard, in his "View of the Recent Invertebrate Fauna of Labrador," published in 1867,* but eight of these are also in Stimpson's list. The nomenclature of the species collected by Packard near Caribou Island in 1860, and on the coast of Labrador in 1864, has been revised (in 1883) by Professor S. I. Smith,† who, also, has determined all the species dredged in the Gulf of St. Lawrence by the writer in 1871, 1872 and 1873, and those obtained on the Labrador coast by the Stearns expedition in 1882.

Family *Hyperidae*.

HYPEROCHE MEDUSARUM (Kröyer).

Metacrus medusarum, Kröyer (1838).*Hyperia medusarum*, Packard (1867).*Hyperoche medusarum*, Bovallius (1887).

Taken at or near the surface, in the towing net, between Anticosti and the Gaspé peninsula, by the writer in 1873. *H. medusarum* had previously

* Memoirs of the Boston Society of Natural History, vol. i., pp. 269-303.

† Proceedings of the U. S. National Museum, vol. vi., pp. 226-230.

been recorded as having been "found, with numerous young, in the stomach-cavity of *Cyanea arctica*, at Domino Harbour, Labrador, in 1864, by Packard.

PARATHEMISTO OBLIVIA (Kröyer).

Hyperia obliuia, Kröyer (1838).

Parathemisto obliuia, Sars (1890).

Found in the bag of the dredge, by the writer, while dredging in 30 fathoms, six miles E.N.E. of Cape Gaspé, in 1872; and in 210 fathoms, about half way between Cap des Rosiers and South-west Point, Anticosti; but in both cases probably taken near the surface, or at some distance from the bottom.

EUTHEMISTO LIBELLULA (Mandt).

Bradelle Bank, dredged by the writer in 1873; young specimens, perhaps also caught at or near the surface. The species has since been taken at Davis Strait and Greenland, by H.M.S. Valorous, in 1875.

(EUTHEMISTO BISPINOSA (Boeck).

Taken by H.M.S. Challenger in 1873, at Stations 46 and 50, south of Halifax, Nova Scotia, but at so great a distance from the coast as to be practically outside of the area embraced within the limits of this paper. The species, however, has been collected off Martha's Vineyard, Mass., by the U. S. Fish Commission, and in Davis Strait by H.M.S. Valorous, so that it may be expected to occur in the Gulf of St. Lawrence).

Family *Caprellidae*.

CAPRELLA LINEARIS (L.).

Squilla lobata, O. Fabricius (1780).

Caprella lobata (Kröyer) Stimpson (1853).

Caprella septentrionalis (Kröyer) Packard (1867).

Caprella linearis (L.); fide Stebbing (1888).

Grand Manan, "among nullipores in 4-6 fathoms" (Stimpson). Abundant along the whole coast of Labrador in from 4 to 30 fathoms, among weeds (Packard).

CAPRELLA SANGUINEA, Gould.

Grand Manan, a very common species in the higher levels of the laminarian zone. "It may be distinguished from the others by its very slender antennæ and proportionately large hands" (Stimpson).

CAPRELLA LONGIMANUS, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 44.

Grand Manan (Stimpson). But, according to Stebbing (in the twenty-ninth volume of the Zoological Reports of the Challenger Expedition, page 276) in Mayer's opinion, both this species and the preceding are "too briefly described for recognition, though the latter may be *C. acanthiifera*, Leach."

CAPRELLA STIMPSONII, Spence Bate.

Caprella Stimpsoni, Spence Bate (1862).*Caprella robusta*, Stimpson (1853); non Dana (1852).

Grand Manan, "dredged on a rocky bottom, in 12 fathoms, back of Duck Island ledge" (Stimpson).

ÆGINA SPINOSISSIMA (Stimpson).

"This beautiful species was dredged in great numbers adhering to *Gemellaria dumosa* in 10 fathoms off Cheney's Head," Grand Manan (Stimpson).

In the original description, the back and sides of this species are said to be covered everywhere with "sharp broad-based spines, some of which are very long." But, Miers says that the largest specimen collected by the naturalists of the Arctic Expedition in 1875-76 has "but few very small spines and many indistinct very small tubercles." Hence it may be that an amphipod from the Bradelle Bank, dredged by the writer in 1873, and referred to in an official report of that year, as a large, tuberculated species of *Caprella*, may be referable to *Æ. spinosissima*.

Family Dulichidae.

DULICHIA PORRECTA, Spence Bate.

Dulichia porrecta, Packard (fide Boeck).

A "rarely found species" on the Labrador coast (Packard),

Family Corophidae.

UNCIOLA IRRORATA, Say.

Grand Manan. "It inhabits invariably sandy bottoms, usually in the laminarian zone, but is occasionally found at low-water mark" (Stimpson). Bay of Fundy (S. I. Smith). H. M. S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms, gravel and stones.

Egmont Bank, N.E. of Shediac Bay, in 4½ fathoms, dredged by the writer in 1873. Caribou Island (Packard).

ERICTHONIUS DIFFORMIS, Milne Edwards.

Erichthonius difformis, M. Edwards (1830).*Cerapus rubricornis*, (Stimpson (1853)*Cerapus rubiformis*, Packard (1867); fide S. I. Smith.

"This species was dredged abundantly on stems of *Boltenia* in 20 fathoms, rocks, off Moose Inlet" (Grand Manan), "towards the Seal Islands. It afterwards occurred sparingly in 10 fathoms, off Cheney's Head, and in 25 fathoms, off Duck Island. Specimens occurred on the tenth of August, with eggs, which were hatched on the 25th of the same month."

"The *Cerapus rubricornis* inhabits flexible tubes, of sizes corresponding to that of the individuals, composed of fine mud and some animal cement by which it is agglutinated. These tubes are generally adherent for about one-half their length, and closed below. They are usually found in large groups, attached to submarine objects, and to each other. The animals are very active, protruding and retracting the anterior portion of their bodies, while their antennæ are in continual motion, lashing about in search of some object which might serve for food. It is very amusing to watch a colony of these animals, with their comical gestures in their disputes with each other, and their awkward celerity in regaining their respective tubes after having left them on temporary excursions" (Stimpson). "Inhabits flexible tubes in *Halecium halecinum*. Eight fathoms, sand, Caribou Island, Strait of Belle Isle. The young had just been hatched on June 20th" (Packard).

Family Podoceridae.

PODOCERUS NITIDUS, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 45.

Grand Manan, "dredged in 30 fathoms on a shelly bottom in the Hake Bay" (Stimpson).

PODOCERUS FUCICOLA (Stimpson).

Cerapus fucicola, Stimpson (1853).*Podocerus fucicola*, S. I. Smith (1873).

Grand Manan, inhabiting "slender tubes, which are found in considerable numbers on large algæ in the laminarian zone" (Stimpson). Common in the Bay of Fundy (Smith).

AMPHITHOE PUNCTATA, Say.

Amphithoe punctata, Say (1818); fide Spence Bate.*Amphithoe virescens*, Stimpson (1853).

Grand Manan, "dredged in 4 fathoms on a nullipore bottom, off Duck Island boat-moorings" (Stimpson).

AMPHITHOE PODOCEROIDES, Rathke.

Amphithoe podoceroides, Rathke (1843).

Amphithoe maculata, Stimpson (1853); and Packard (1867).

Grand Manan, "on rocky bottoms in the coralline zone, and occasionally at low-water" (Stimpson). Henley Harbour, Strait of Belle Isle, in 8 fathoms (Packard). In his report on the Challenger Amphipoda, however, the Rev. T. R. R. Stebbing doubts whether Stimpson's *A. maculata* is sufficiently distinct from *A. punctata*.

Family Ampeliscidae.

AMPELISCA TYPICA, Spence Bate.

Egmont Bank, Northumberland Strait, also between the Egmont Bank and Shediac Bay, dredged by the writer in 1873.

AMPELISCA ESCHRICHTII, Kröyer.

Specimens of this species were dredged by the writer in 1872, seven miles W. by N. of Cap des Rosiers, in 110 fathoms; six miles E.N.E. of Cape Gaspé in 30 fathoms, and eleven miles from Percé in 60 fathoms; also in 1873, in Gaspé Bay, 30 fathoms, and on the Orphan and Bradelle banks. The species had previously been taken by Packard in 1860 at Caribou Island, in 14 fathoms, and specimens from this locality are stated to have been identified by Dr. Stimpson, and Mr. A. Boeck.

AMPELISCA MACROCEPHALA, Lilljeborg.

Ampelisca macrocephala, Lilljeborg (1852).

Pseudophthalmus pelagicus, Stimpson (1853).

Ampelisca pelagica, Packard (1863 and 1867); fide S. I. Smith.

"Taken on a soft muddy bottom in 35-50 fathoms off Long Island, Grand Manan, and in 30 fathoms sand in the Hake Bay" (Stimpson). Dredged by the writer in 1873, between Cape Bear, P.E.I., and Pictou Island; also in Northumberland Strait, between Richibucto and Miramichi. Caribou Island, P.Q., in 8 fathoms sand; Chateau Bay, (opposite Belle Isle) in 30 fathoms; Stag Bay (Labrador), in 10 fathoms; Long Island, in 15 fathoms; and near Strawberry Harbour, in 14 fathoms (Packard).

HAPLOORS TUBICOLA, Lilljeborg.

Bay of Fundy (S. I. Smith). Gaspé Bay, 30 fathoms (Whiteaves). Cateau Harbor, Long Island, ten miles above Domino Harbour, Labrador, in 15 fathoms (Packard).

HAPLOOPS SETOSA, Boeck.

"I have received specimens under this name from Prof. S. I. Smith, which were taken in the Bay of Fundy, N.E. America. I am inclined, however, to think that they should be referred to *Haploops robusta*, G. O. Sars" (Rev. Canon Norman).*

Similar specimens were dredged by the writer in 1872 and 1873, off Cape George, N.S.; Port Hood, C.B.; and the east point of Prince Edward Island; on the Bradelle Bank; in Gaspé Bay; off Cape Gaspé and Cap des Rosiers; in from 30 to 110 fathoms.

BYBLIS GAIMARDII (Kröyer).

Ampelisca Gaimardi, Packard (1867).

Byblis Gaimardii (Kröyer) S. I. Smith (1883).

Casco Bay and the Bay of Fundy, on muddy bottoms, in 10 to 60 fathoms (S. I. Smith, 1872). In the same year the writer dredged specimens of it in the Gulf of St. Lawrence five miles and a quarter to the E.S.E. of Bonaventure Island; and in 1873, on the Bradelle Bank; and between it and Miscou Island, in 45 fathoms; also between Cap d'Espoir (Despair) and Grand Pabou, in 50 and 70 fathoms. Packard says that it was not uncommon in Chateau Bay, Labrador, in 30 fathoms, and at Cateau Harbour, Long Island, in 15 fathoms, sand.

Family Gammaridae.

GAMMARUS LOCUSTA (L.) J. C. Fabricius.

Gammarus locusta, J. C. Fabricius (1775).

Oniscus pulex, O. Fabricius (1780).

Gammarus ornatus, Milne Edwards (1830).

Gammarus pulex, Stimpson (1853).

Gammarus mutatus (Lilljeborg) Packard (1867).

The common "beach flea" or "sandhopper" of the Gulf of St. Lawrence. Abundant at or near low-water mark, on sandy shores, throughout the whole district. Common also on the Labrador coast (Packard); Greenland (O. Fabricius); and more recently, taken by Bell at Port Burwell, Cape Chudleigh, Hudson Strait.

GAMMARACANTHUS MACROPHthalmus (Stimpson).

Gammarus macrophthalmus, Stimpson (1853).

Gammaracanthus macrophthalmus, Spence Bate (1862).

Grand Manan, "dredged on sandy bottoms in the laminarian zone, and occasionally taken at low-water mark" (Stimpson).

* Annals and Magazine of Natural History for April, 1900, p. 346.

AMATHILLA HOMARI (J. C. Fabricius)

Astacus Homari, J. C. Fabricius (1779); fide Stebbing.

Oniscus arenarius, O. Fabricius (1780); fide Hansen.

Gammarus Sabini, Leach (1819); and Stimpson (1853).

Amathilla Homari, Stebbing (1888).

Grand Manan (Stimpson); Greenland (O. Fabricius).

MÆRA DANÆ (Stimpson).

Leptothoe Danæ, Stimpson (1853).

Mæra Danæ, Spence Bate (1862).

Grand Manan. "This species inhabits the laminarian zone, and seems to prefer for its residence patches of sandy bottom, on which there are numerous weedy rocks. I have frequently taken what appeared to be the young, in the coralline zone. It is more sluggish in its motions than is usual with amphipods" (Stimpson).

MÆRA. (Species undetermined.)

Off Cape George lighthouse, N.S., in from 22 to 30 fathoms, dredged by the writer in 1873.

MELITA DENTATA (Krøyer).

Gammarus dentatus, Krøyer (1842); and Packard (1867).

Gammarus purpuratus, Stimpson (1853).

Melita dentata, Boeck (1870).

Grand Manan, "taken on a sandy bottom, in 12 fathoms, off Cheney's Head" (Stimpson). Common in the Bay of Fundy (S. I. Smith). Dredged by the writer in the Gulf of St. Lawrence, off Bonaventure Island, in 50 fathoms, in 1872; and between the Brédelle Bank and Miscou Island, in 45 fathoms; also in Gaspé Bay, in 30 fathoms, in 1873. Strait of Belle Isle, 15 fathoms, mud; Chateau Bay, 20 to 30 fathoms; and Square Island, Labrador, in 15 to 30 fathoms (Packard).

MELITA GOESII, Hansen.

Dredged by the writer, in 1873, between Port Hood, C.B., and the east point of Prince Edward Island; off Cape George, N.S.; and between Cap d'Espoir and Grand Pabou, in 70 fathoms. Figured by Goes as a form of *Melita dentata* (S. I. Smith).

MELPHIDIPPA. (Species undetermined.)

About half way between Anticosti and the Gaspé peninsula, in 220 fathoms; also (a fragment) off Richibucto, N.B., in 14 fathoms; dredged by the writer in 1873.

LEPTOCHEIRUS PINGUIS (Stimpson).

Ptilocheirus pinguis, Stimpson (1853).

Leptocheirus pinguis, Stebbing (1888).

"This species is abundant on the whole coast of New England, as well as at Grand Manan. It is most abundant on sandy bottoms in the laminarian zone; although sometimes occurring at low-water mark, as at Fisher's Cove; or in the coralline zone, as in 25 fathoms, off Duck Island" (Stimpson). "Common on the whole coast of New England upon muddy bottoms and north to Labrador. In depth it extends down to 150 fathoms, and probably much farther" (S. I. Smith). In the Gulf of St. Lawrence, it has been dredged by the writer on the Bradelle Bank, and between it and Miscou Island; also between Cape Bear, P.E.I., and Pictou Island, N.S.; and at two localities in Northumberland Strait.

Family *Pardaliscidae*.

PARDALISCA CUSPIDATA, Kröyer.

Off Cape Bon Ami, Gaspé, in 30 fathoms, dredged by the writer in 1873.

Family *Eusiridae*.

EUSIRUS CUSPIDATUS, Kröyer.

One large specimen was dredged by the writer on the Orphan Bank, in 1873, and others, in the northern part of the Gulf of St. Lawrence, in 1871.

RHACOTROPIS ACULEATUS (Lepechin).

Oniscus aculeatus, Lepechin (1780).

Amphitonotus Edwardsii, Packard (1867).

Tritropis aculeata, Boeck (1870).

Rhacotropis aculeata, Smith (1883).

Le Have Bank, Nova Scotia, in 45 and 60 fathoms, U. S. Fish Commission, 1872 (Smith and Harger); and H.M.S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms. Gulf of St. Lawrence, on the Orphan and Bradelle banks; in 56 fathoms, 8 miles S.E. of Bonaventure Island; and in 30 fathoms, off Cape Bon Ami, Gaspé, —dredged by

the writer. Square Island, Labrador, at a depth of 30 fathoms (Packard). Henley Harbour, 10-15 fathoms; and Temple Bay, Labrador, in 10 fathoms, Stearns expedition (S. I. Smith).

Family *Atylidae*.

HALIRAGES FULVOCINCTUS (M. Sars).

Amphithoe fulvocincta, M. Sars (1859).

Halirages fulvocinctus, Boeck (1870).

Off Chebucto Head, Halifax Harbour, N.S., in 20 fathoms, soft mud and fine sand, with decaying sea-weed, U. S. Fish Commission, 1872 (Smith and Harger); and H.M.S. Challenger, Station 49, (May 20, 1873) south of Halifax, in 85 fathoms. Gulf of St. Lawrence, at Gaspé Bay, in 30 fathoms; and between Anticosti and the Gaspé peninsula, in 220 fathoms,—dredged by the writer. Henley Harbour, Strait of Belle Isle, 10 to 20 fathoms, hard, weedy bottom (Packard).

HALIRAGES BISPINOSUS (Spence Bate).

Dexamine bispinosa, Spence Bate (1857).

Paramphithoe elegans, Bruzelius (1859).

Atylus bispinosus, Spence Bate (1862).

Halirages bispinosus, Boeck (1870).

Henley Harbour, north side of the Strait of Belle Isle (Packard).

PONTOGENEIA INERMIS (Kröyer).

Amphithoe inermis and *crenulata*, Kröyer (1838).

Iphimedia vulgaris, Stimpson (1853).

Pontogeneia inermis, Boeck (1860).

Atylus vulgaris, Packard (1867).

Grand Manan. Specimens of this species "may always be found in the greatest abundance in the little pools left by the tide among the rocks near low-water mark. They are very active, swimming about in all directions, and seldom resting long in one place" (Stimpson). The species "is abundant in company with *Calliopius laeviusculus*, about the Bay of Fundy in pools left by the tide, and ranges north to Labrador and Greenland" (S. I. Smith). Packard says that he has collected specimens of it at Henley Harbour, in 4 fathoms; Square Island, Labrador, in 15 fathoms; and Stag Bay, Labrador, in "15 fathoms, on a hard, weedy bottom."

CALLIOPIUS LAEVIUSCULUS (Krøyer).

Amphithoe laeviscula, Krøyer (1838).

Calliope laeviscula, Spence Bate (1862).

Calliopius laevisculus, Boeck (1870).

Vineyard Sound and northward to Greenland, northern Europe and Spitzbergen. In the Bay of Fundy specimens of this species have been taken, with the preceding species, by the U.S. Fish Commission. In the Gulf of St. Lawrence, similar specimens were collected by the Anticosti expedition of 1861, at the Magdalen Islands (where they are said to be "abundant at the surface of the water in the caverns under eroded cliffs"); also by the writer in 1872, by a towing net, at the surface. At Henley Harbour, and Stag Bay, Labrador, specimens of it were dredged by Packard in 1864, associated with *Pontogeneia inermis*.

Family Iphimediidae.

LAFYSTUS STURIONIS, Krøyer.

A specimen which Professor S. I. Smith thinks is probably referable to this species, was taken by the U.S. Fish Commission in 1871, "from the back of a skate (*Raia laevis*) in the Bay of Fundy."

"Parasitic on *Cottus*, Halifax, May, 1873" (H.M.S. Challenger Reports, Zoology, vol. xxix., text, second half, p. 899).

Family Epimeridae.

EPIMERIA LORICATA, G. O. Sars.

Epimeria coniger (*cornigera*) S. I. Smith; Whiteaves (1872).

Epimeria cornigera, Verrill; Smith; and Whiteaves (1874).

Epimeria loricata, G. O. Sars (1879); and Smith (1881).

H. M. S. Challenger, Station 49, (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms. Dredged by the writer in 1871, in 125 fathoms, mud, six miles from shore, immediately opposite Cap des Rosiers lighthouse; and in 212 fathoms, mud, off the east point of Anticosti, bearing S. by W., twenty-four miles distant. Also, in 1872 and 1873, about half way between Anticosti and the Gaspé peninsula, in 200 fathoms. A brilliant coloured species, and one of the most characteristic amphipods of the greatest depths in the northern part of the Gulf of St. Lawrence. Sars says of it, "colour a gorgeous red;" and again, "colour a magnificent coral-red, a trifle more vivid on the posterior margin of each segment" (Stebbing).

Family *Pleustidae*.

PLEUSTES PANOPLUS (Kröyer).

Amphithoe panopla, Kröyer (1838).*Pleustes panoplus*, Spence Bate (1862).*Amphithonotus cutaphractus*, Packard (1867).

H. M. S. Challenger, Station 49, (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms." "Henley Harbour, at a depth of 4 fathoms, among weeds. Not uncommon" (Packard). L'Anse au Loup, Strait of Belle Isle, in 10 fathoms, one specimen, Stearns expedition (S. I. Smith). Port Burwell, Cape Chudleigh, Hudson Strait, Bell (S. I. Smith).

PLEUSTES BICUSPIS (Kröyer).

"A single specimen of this species was sent, with *Atylus* (*Paramphithoe*) *inermis*" "to the Museum of Yale College by Packard." "No special locality was given for the specimens, but they were most likely from Henley Harbour, as that is the only locality given by Packard for the *Atylus*" (S. I. Smith; Proc. U. S. Nat. Mus., vol. vi., p. 228).

Family *Oediceridae*.

OEDICEROS LYNCEUS, M. Sars.

Oediceros lynceus, M. Sars (1859).*Monoculodes nubilatus*, Packard (1867); fide S. I. Smith.

H. M. S. Challenger, Station 49, (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms. "We dredged this species in the Bay of Fundy in 1868 and 1872, the latter year in 60 to 80 fathoms" (Smith and Harger). Gulf of St. Lawrence, on the Bradelle Bank; between Cap d'Espoir and Little Pabou, a little to the north of the Baie des Chaleurs, in 50 and 70 fathoms; also in Gaspé Bay, in 30 fathoms; (Whiteaves). Caribou Island, 8 fathoms, sand (Packard). "At Henley Harbour," Strait of Belle Isle, "a female, with several young attached to the underside, was dredged in 4 fathoms the last of June," 1864 (Packard). Dredged by the Stearns expedition on the north shore of the Strait of Belle Isle, at Forteau Bay in 20 fathoms, at L'Anse au Loup in 15 fathoms, at Henley Harbour in 10-15 fathoms, and at Temple Bay in 10 fathoms (S. I. Smith). Port Burwell, Cape Chudleigh, Hudson Strait, Bell (S. I. Smith).

OEDICEROS SAGINATUS, Kröyer.

Murray Bay, Sir J. W. Dawson (S. I. Smith).

ACANTHOSTEPHIA MALMGRENI, Goes.

Dredged by the writer in 1873, a little to the north of the Baie des Chaleurs, in 70 fathoms, Cap d'Espoir bearing S. $\frac{1}{4}$ W., six miles distant.

MONOCULODES DEMISSUS, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 54.

Grand Manan, "dredged in 4 fathoms, on a coarse sand and nullipore bottom, off Duck Island boat-moorings" (Stimpson),

MONOCULODES BOREALIS, Boeck.

Oedicros affinis, (Goes (1865); non Bruzelius.

Monoculodes borealis (Boeck) S. I. Smith (1874).

Off Chebucto Head, Halifax Harbour, in 20 fathoms, soft mud and fine sand, with decaying sea-weed, U. S. Fish Commission, 1872 (Smith and Harger).

An undetermined species of *Monoculodes* was dredged by the writer in 1872, in 60 fathoms, five miles and a quarter E.S.E. of Bonaventure Island.

ACEROS PHYLLONYX, M. Sars.

Gulf of St. Lawrence, a little north of the Baie des Chaleurs, between Cap d'Espoir and Grand Pabou, in 70 and 50 fathoms, dredged by the writer in 1872.

PARAMPHITHOE CATAPHRACTA (Stimpson).

Amphithonotus cataphractus, Stimpson (1853).

Paramphithoe cataphracta, S. I. Smith (1874).

Grand Manan, "in 10 fathoms, on a sandy bottom, inside of Duck Island ledge" (Stimpson). Bay of Fundy, 5-50 fathoms (S. I. Smith). Le Have Bank, Nova Scotia, in 45 fathoms, U. S. Fish Commission, 1872 (Smith and Harger). Mouth of the St. Lawrence River, at Murray Bay, Sir. J. W. Dawson (S. I. Smith). "Taken at Henley Harbour, Strait of Belle Isle at a depth of 4 fathoms, among weeds. "Not uncommon" (Packard).

PARAMPHITHOE PULCHELLA (Kröyer).

Off Casco Bay and in the Bay of Fundy, on hard bottoms, in from 40 to 90 fathoms (S. I. Smith). Gulf of St. Lawrence, on the Bradelle Bank, in 25 fathoms, dredged by the writer in 1873.

ACANTHONOTOZOMA SERRATUM (Fabricius).

Oniscus serratus, O. Fabricius (1780).*Amphithoe serra*, Kröyer (1836).*Acanthonotus serratus*, Stimpson (1853).*Vertumnus serratus*, S. I. Smith (1872).*Acanthonotozoma serratum*, Boeck (1876).

Grand Manan, "in 35 fathoms on a gravelly bottom, north-east of Nantucket Island" (Stimpson); "It is not uncommon on hard bottoms in from 5 to 50 fathoms in the Bay of Fundy" (S. I. Smith). Gulf of St. Lawrence, on the Bradelle Bank, and just inside of Gaspé Bay in 30 fathoms, dredged by the writer in 1873. Dead Island, coast of Labrador, shallow water, one specimen; Stearns expedition (S. I. Smith).

ACANTHOTOZOMA INFLATUM (Kröyer).

Acanthonotus inflatus, Kröyer (1842).*Acanthotozoma inflatum*, Boeck (1876).

North shore of the Strait of Belle Isle, at L'Anse au Loup, in 8 fathoms, rocky bottom, one specimen; Stearns expedition (S. I. Smith).

ACANTHOZONE CUSPIDATA (Lepechin).

Oniscus cuspidatus, Lepechin (1780).*Acanthozone cuspidata*, Boeck (1870).

"This species is quite common on hard, and especially on spongy bottoms, in 5 to 40 fathoms, in the Bay of Fundy, although it is not mentioned by Stimpson in his work on Grand Manan" (S. I. Smith, 1872). Le Have Bank, Nova Scotia, in 60 fathoms, U. S. Fish Commission, 1872, (Smith and Harger). Gulf of St. Lawrence; dredged by the writer in 1872 off Cap des Rosiers, in 70 to 80 fathoms; and in 1873 on the Orphan Bank, where it was fine and frequent. Temple Bay, Labrador, in 10 fathoms, one specimen; Stearns expedition (S. I. Smith).

A species of *Acanthozone*, which Professor Smith thinks is undescribed, was dredged by the writer in 1873, just inside of Gaspé Bay, in 30 fathoms.

Family *Pontoporeidae*.

PONTOPOREIA FEMORATA, Kröyer.

Gulf of St. Lawrence, five miles and a quarter E.S.E. of Bonaventure Island, in 60 fathoms, dredged by the writer in 1872. Belles Amours, Strait of Belle Isle, abundant in 5 to 8 fathoms, muddy bottom (Packard). Fox Harbour, Labrador, 1-4 fathoms; Stearns expedition (S. I. Smith).

Family *Phoxocephalidae*.*PHOXOCEPHALUS HOLBOLLI* (Kröyer).*Phoxus Holbolli*, Kröyer (1842).*Phoxus Kroyeri*, Stimpson (1853).*Phoxocephalus Holbolli*, G. O. Sars (1891).

Grand Manan, "taken at low-water mark, on a sandy shore, at High Duck Island" (Stimpson). "From low water to 20 fathoms in the Bay of Fundy"—common (S. I. Smith, 1872). Gulf of St. Lawrence, thirty miles north-east of Cap des Rosiers. in 200 fathoms, mud; dredged by the writer in 1872. L'Anse au Loup, Strait of Belle Isle, in 15 fathoms, one specimen; Stearns expedition (S. I. Smith).

HARPINIA FUSIFORMIS (Stimpson).*Phoxus fusiformis*, Stimpson (1853).*Harpinia fusiformis*, S. I. Smith (1872).

Grand Manan, "dredged on coarse sandy bottoms, in the laminarian and coralline zones" (Stimpson). Bay of Fundy, in 20 to 60 fathoms muddy bottom (S. I. Smith). Gulf of St. Lawrence, dredged by the writer in 1872, five miles and a quarter E.S.E. of Bonaventure Island, in 60 fathoms; and in 1873, on the Bradelle Bank; also eighteen miles east of Cape Gaspé, in 220 fathoms.

In the Challenger Reports, however, (Zoology, vol. xxix., text, first half, p. 279) Stebbing says that "*Phoxus fusiformis* is identified by Spence Bate with *Phoxus plumosus*, Kröyer, which Boeck places in his genus *Harpinia*."

Family *Syrrhoidæ*.*SYRRHOE CRENULATA*, Goes.

Off Grand Manan in 90 to 100 fathoms, 1872 (S. I. Smith). Le Have Bank, Nova Scotia, in 45 fathoms, U.S. Fish Commission, 1872 (Smith and Harger). Gulf of St. Lawrence, just inside of Gaspé Bay, in 30 fathoms, dredged by the writer in 1873.

TIRON ACANTHURUS, Lilljeborg.*Syrrhoe bicuspis*, Goes (1865).*Tiron acanthurus*, Lilljeborg (1865).

Le Have Bank, Nova Scotia, in 45 fathoms, U.S. Fish Commission, 1872, (Smith and Harger).

Family *Leucothoidæ*.

LEUCOTHOE GRANDIMANUS, Stimpson.

1853. Synops. Marine Invert. Grand Manan, p. 51.

Grand Manan, "dredged in 30 fathoms, on a shelly bottom off Low Duck Island" (Stimpson).

Family *Stenothoidæ*.

STENOTHOE CLYPEATA, Stimpson.

1853. Op. cit., p. 51.

Grand Manan, "dredged in 30 fathoms, on a shelly bottom in the Hake Bay" (Stimpson).

METOPA GLACIALIS (Kröyer).

Leucothoe glacialis. Kröyer (1842).

Metopa glacialis, Boeck (1870).

Between the inner and outer integuments of specimens of *Ascidioopsis complanata*, dredged by the writer in the Gulf of St. Lawrence, on the Orphan Bank, in 1873.

Family *Stegocephalidæ*.

STEGOCEPHALUS INFLATUS, Kröyer.

H. M. S. Challenger, Station 49, (May 20, 1873) south of Halifax, in 85 fathoms. Gulf of St. Lawrence, dredged by the writer, in 1872, eight miles S.E. of Bonaventure Island in 56 fathoms; also, in 1873, on the Bradelle Bank; a little to the north of the Baie des Chaleurs, in 50 and 70 fathoms; and due east of Mal Baie, in 110 fathoms.

In 1883 Professor S. I. Smith expressed the opinion that *Stegocephalus inflatus* (Kröyer, 1842) is the same as *Cancer ampulla* (Phipps, 1774) and that the proper name for the species is *Stegocephalus ampulla*.

Rev. Thos. R. R. Stebbing, however, in his Report upon the Challenger Amphipoda, published in 1888, adopts the name *S. inflatus* (Kröyer), although he includes *Cancer ampulla* as one of its synonyms. On page 599 of that report, he says that, according to Dr. Hansen, "Phipps' species must be the same as *Stegocephalus kessleri*, Stuxberg."

Rev. Canon Norman, in one of his recent papers on the British Amphipoda*, adopts the name *S. inflatus* (Kröyer) for this species, and says that it is not the *Cancer ampulla* of Phipps.

* Annals and Magazine of Natural History for July, 1900, p. 32.

Family *Lysianassida*.

LYSIANAX SPINIFERA (Stimpson).

Lysianassa spinifera, Stimpson (1853).• *Lysianax spinifera*, Stebbing (1888).

Grand Manan, "dredged in 40 fathoms on a soft muddy bottom, off Long Island" (Stimpson).

ORCHOMENE MINUTUS (Kröyer).

Anonyx minutus, Kröyer (1846).*Orchomene minutus*, Boeck (1870).

Henley Harbour, Strait of Belle Isle, in 10 to 15 fathoms, one specimen; Stearns expedition, 1882. "Not mentioned by Packard, but all the specimens sent to the Museum of Yale College as '*Anonyx Horringtonii*' are apparently of this species, which occurs upon the New England coast, and is sometimes very abundant in Vineyard Sound in winter" (S. I. Smith, 1883).

(ONISIMUS EDWARDSII (Kröyer).

Anonyx Edwardsii, Kröyer (1846).*Onisimus Edwardsii*, Boeck (1870).

"Atlantic coast" of Labrador "(Packard's collection). This species is not mentioned by Packard, but a single specimen of it was sent, with *Anonyx nugax*, by him to the Museum of Yale College"; S. I. Smith, 1883.)

TRYPHOSA HÖRRINGII, Boeck.

? "*Anonyx Hörringii*, fide Boeck," Packard (1867).*Tryphosa Hörringii*, Boeck (1870); fide S. I. Smith.

"Boeck undoubtedly had specimens of this species from Packard's collections, for he (Skandinaviske og Arktiske Amphipoder, p. 184) distinctly mentions it as having been found in Labrador by Packard, but" "all the specimens sent by Packard under the above name to the Museum of Yale College belong to Boeck's genus *Orchomene*, so that it is doubtful if the 'common form occurring abundantly on the coast of Maine,' was the same species as the specimens sent to Boeck" (S. I. Smith, 1883, Proc. U. S. Nat. Mus., vol. vi, p. 227).

ANONYX NUGAX (Phipps).

Cancer nugax, Phipps (1774).

Anonyx lagena, Kröyer (1838).

Anonyx appendiculata, Kröyer (1838).

Anonyx nobilis, Stimpson (1853); fide Stebbing.

Anonyx ampulla (Phipps) Packard (1867).

Anonyx lagena, Packard (1867).

Lysianassa appendiculata, Packard (1867).

Grand Manan (*L. vilis*) taken in considerable numbers on the sandy flats of Fish Harbour, Nantucket Island, etc., at low-water mark (Stimpson).

Strait, Isle, off Henley Harbour, in 40 fathoms, on a pebbly bottom, three miles from land (*L. appendiculata*); and Atlantic coast of Labrador, at Dumplin Harbour, Sandwich Bay, in 4 fathoms (*A. ampulla*); and at Sloop Harbour, Kyuetaubuck Bay, in 8 fathoms, sand (*A. lagena*); Packard. Henley Harbour, 10–15 fathoms; and Fox Harbour, 3 fathoms; Stearns expedition (S. I. Smith). Port Burwell, Cape Chudleigh, Hudson Strait; Bell, 1884 (S. I. Smith). "*Cancer ampulla*, Phipps, was supposed by Kröyer to be this species, but it really belongs to Kröyer's genus *Stegocephalus*, and is *S. ampulla*, Bell (*S. inflatus*, Kröyer); so that it might appear doubtful what species Packard included under '*Anonyx ampulla* (Phipps)' were it not that he says that it was 'compared with arctic specimens received from Copenhagen,' which seems to leave no doubt that he really had in view *Anonyx nugax*, although he subsequently, as indicated above, enumerated this same species under two other names" (S. I. Smith, 1883, Proc. U. S. Nat. Mus., vol. vi., pp. 226 and 227).

ANONYX PUMILUS, Lilljeborg.

"*Anonyx producta*, fide Bceck," Packard (1867).

Anonyx pumilus, Lilljeborg (1865); and S. I. Smith (1883).

Labrador coast (Packard). "I have seen no specimens. The species is placed immediately after '*Anonyx Herringii*' by Packard, who says only 'these two forms were found together in fifteen fathoms, sand,' although under the first of the two species he has nothing except the remark, 'a common form, occurring abundantly on the coast of Maine, in Casco Bay, 10 fathoms,' (S. I. Smith; op. cit., p. 227).

ANONYX POLITUS, Stimpson.

1863. Synops. Marine Invert. Grand Manan, p. 50.

Grand Manan, "dredged in 40 fathoms, on a soft muddy bottom off Long Island" (Stimpson).

Anonyx politus, n. sp., according to Spence Bate, has nothing in the description to distinguish it from *Anonyx holbolli*. "*Anonyx holbolli* of

Bate, according to Boeck. = *Anonyx gulosus*, Kröyer, from which it may be inferred that *Anonyx politus* is a synonym of *Anonyx gulosus*, which is itself probably the same as '*Oniscus Cicada*,' Fabricius" (Stebbing).*

ANONYX PALLIDUS, Stimpson.

1853. Op. cit., p. 50.

Grand Manan, "in 4 fathoms, in sand, off Duck Island moorings; in 10 fathoms off Cheney's Head; and in 20 fathoms, mud and shells, off the northern point of Duck Island" (Stimpson).

ANONYX EXIGUUS, Stimpson.

1853. Op. cit., p. 51.

Grand Manan, "dredged on sandy bottoms in 8-15 fathoms, east of the Passage, and off Cheney's Head" (Stimpson).

Family Orchestidae.

HYALE LITTORALIS (Stimpson).

Allorchestes littoralis, Stimpson (1853).

Hyle littoralis, S. I. Smith (1873).

"Taken abundantly on stones in the second subregion of the littoral zone, especially where the *Fucus nodosus* and *F. vesiculosus* flourish. It occurs on our whole coast, from Massachusetts Bay to Grand Manan" (Stimpson). "Common in the Bay of Fundy" (S. I. Smith).

ORCHESTIA GRYLLUS, Gould.

Orchestia gryllus, Gould (1841); and Stimpson (1853).

Grand Manan, "found plentifully among the half-dried *Fuci*, which line some of the shores just above high-water mark, in large quantities. It is of a dark-yellowish colour, very glossy, with three dark olive longitudinal bands along the back. It is very active, leaping to considerable distances. I have never found it immersed, although some moisture is, of course, necessary to its existence" (Stimpson).

ORCHESTIA AGILIS, S. I. Smith.

1873. U. S. Fish Comm. Rep. for 1871-72, p. 555.

Bay of Fundy (S. I. Smith).

* H.M.S. Challenger Reports, Zoology, vol. XXIX., text, first half, p. 278.

ISOPODA.

Family *Bopyridæ*.

GYGE HIPPOLYTES (Kröyer).

Bopyrus Hippolytes, Kröyer (1838).*Gyge Hippolytes*, Bate and Westwood (1868).

"Bay of Fundy, on *Hippolyte spinus* and *H. pusiola*," 1868, 1872. "Off Halifax, Nova Scotia, 43 fathoms, September 27, 1877" S. I. Smith (O. Harger).* Gulf of St. Lawrence, eight miles S.E. of Bonaventure Island, in 56 fathoms stones and coarse sand, one specimen, on *Hippolyte* (now called *Spirontocaris*) *spinus*, which was dredged by the writer in 1872 and identified with this species by Professor S. I. Smith. A specimen dredged by the writer in 1873, on the Orphan Bank, parasitic on *Pandalus Montagu*, Professor Smith thinks is also probably referable to this species. The species is known to range from Massachusetts Bay to Greenland and the east side of Smiths Strait, north latitude 81° 44'.

PHRYXUS ABDOMINALIS (Kröyer).

Bopyrus abdominalis, Kröyer (1838).*Phryxus abdominalis*, Lilljeborg (1852).

"Halifax, Nova Scotia, on *Hippolyte pusiola*, 13 fathoms, fine sand, September 4, 1877; also on *H. spinus*. About thirty miles south of Halifax, on *Hippolyte securifrons*, 100 fathoms, fine sand, September 6, 1877" (Harger). Strait of Belle Isle at L'Anse au Loup, on a female *Hippolyte* (now called *Spirontocaris*) *Gaimardii*, Stearns expedition; and Port Burwell, Cape Chudleigh, Hudson Strait, Bell, one specimen, on *Hippolyte polaris* (S. I. Smith). On the American side of the Atlantic, according to Mr. Harger, *P. abdominalis* ranges from Massachusetts Bay, to Greenland, Grinnell Land, and Discovery Bay, north latitude 81° 44'.

DAJUS MYSIDIS, Kröyer.

Dajus Mysidis, Kröyer (1849).*Bopyrus Mysidum*, Packard (1867).

Labrador (Packard). "Packard does not say from what part of the coast his specimens came, but they were undoubtedly from *Mysis oculata*, which he says is abundant along the whole coast. "I have seen no specimens" (S. I. Smith, Proc. U. S. Nat. Mus., vol. vi., pp. 230 and 231).

* All the quotations to which Mr. Harger's name is here appended, are from his "Marine Isopoda of New England and adjacent waters," published in 1880, in the Report of the U.S. Fish Commission for 1878, pp. 297-462; and "Notes on New England Isopoda," published in 1880, in the Proceedings of the U. S. National Museum for 1879, vol. ii., pp. 157-165.

Family *Asellidae*.*JÆRA ALBIFRONS*, Leach.*Jæra albifrons*, Leach (1813-14).*Jæra copiosa*, Stimpson (1853); and Packard (1863).*Jæra nivalis*, Packard (1867).*Asellus Greenlandicus*, Packard (1867).

"Found in great numbers on our whole New England coast north of Cape Cod, living on the under surfaces of stones in the first (upper) subregion of the littoral zone." "At Grand Manan it was most frequent in sheltered situations" (Stimpson). Long Island Sound to Labrador (Harger). Gulf of St. Lawrence, off Caribou Island; and Sandwich Bay, Square Island, Indian Tickle, and Hopedale, Labrador (Packard). Fox Harbour, Labrador, Stearns expedition (S. I. Smith; op. cit., p. 231).

JANIRA ALTA (Stimpson).*Asellodes alta*, Stimpson (1853).*Janira alta*, Harger (1879).

"Dredged in soft mud in 40 fathoms, off Long Island, Grand Manan" (Stimpson). "A northern species not as yet found south of Massachusetts Bay, occasionally collected in tide pools, but usually dredged, and extending to a depth of 190 fathoms" (Harger).

JANIRA SPINOSA, Harger.

"The only specimens yet known are two females, which were taken adhering to the cable of the schooner Marion, by Captain J. W. Collins, at Banquereau (Nova Scotia) August 25, 1878" (Harger).

MUNNA FABRICII, Kröyer.

Casco Bay, Bay of Fundy; and in 53 fathoms, Brown's Bank, off Nova Scotia (Harger).

Family *Munnopsidae*.*MUNNOPSIS TYPICA*, M. Sars.

"Bay of Fundy, between Head Harbour and the Wolves, in 60 fathoms, muddy bottom, U. S. Fish Commission, August 16, 1872" (Harger). Gulf of St. Lawrence, between Anticosti and the Gaspé peninsula, in 125 to 220 fathoms, dredged by the writer in 1871 and 1872. Baffin Bay, in 100 fathoms, Valorous expedition (Norman); off Cape Napoleon, Grinnell Land, in 25 to 50 fathoms (Miers).

EURYCOPE ROBUSTA, Harger.

1878. Amer. Journ. Sc. and Arts, Third Series, vol. xv., p. 375.

The type or types of this species was or were dredged by the writer in 1873 in the Gulf of St. Lawrence, about half way between Cap des Rosiers and the South-west Point of the Island of Anticosti, in 220 fathoms, mud. In 1879 Mr. Harger said that it had not yet been "found south of the Gulf of St. Lawrence."

Family *Idoteidae*.

CHIRIDOTEA CECA (Say).

Idotea ceca, Say (1818); et auct.

Chiridotea ceca, Harger (1878).

Halifax, Nova Scotia, at low-water, taken by the U. S. Fish Commission in 1877 (Harger). A Florida and New England species, which so far has not been found farther to the northward than Halifax.

CHIRIDOTEA TUFTSII (Stimpson).

Idotea Tuftsii, Stimpson (1853).

Chiridotea Tuftsii, Harger (1878).

Grand Manan, "dredged on a sandy bottom in 10 fathoms, off Cheney's Head" (Stimpson). Halifax, N.S., outer harbour, in 18-25 fathoms, 1877 (Harger).

IDOTEA MARINA (L.).

Stenosoma irrorata, Say (1818).

Idotea irrorata, Edwards (1840); and Stimpson (1853).

Idotea marina (L.); fide Norman (1894).

Stimpson says that *I. irrorata* is "found on marine plants about low-water mark" at Grand Manan. "It rarely occurs here, although so common on the south-western portions of the coast of Maine." Harger says that it is "found along the whole coast of New England and extends southward along the coast of New Jersey, at least as far as Great Egg Harbour, and northward to Nova Scotia and the Gulf of St. Lawrence, where it has been collected by Mr. J. F. Whiteaves. From Cape Cod southward it is abundant, but towards the north it is, mostly, replaced by *I. phosphorea*. It is commonly found among sea-weed along the rocky shores of bays and sounds or among the rocks, where its variety of colours affords it protection. It is also found far from land, attached to floating sea-weed, and was thus taken by Professor S. I. Smith and the writer on Georges Banks, September 14 and 15, 1872, at about 41° N. lat., 65° W. long."

Similar specimens were taken by the U. S. Fish Commission in 1872, in the Bay of Fundy, at low-water and at the surface; and in 1877, off Halifax and the Atlantic coast of Nova Scotia. In the Gulf of St. Lawrence this species was collected by the writer, in 1872, at the Magdalen Islands, in a towing net, in floating weed; and in 1873, by a towing net off Pictou and in Shediac Bay; at low-water at Pointe du Chêne, Shediac Bay; and, by the dredge, in $4\frac{1}{2}$ fathoms, on the Egmont Bank, Northumberland Strait.

IDOTEA PHOSPHOREA, Harger.

"This species is found associated with the last among rocks and sea-weed along the entire coast of New England and extends northward to Halifax, Nova Scotia, and the Gulf of St. Lawrence. It appears to be a more northern species than *I. irrorata*, as it is comparatively rare south of Cape Cod, while it is abundant in Casco Bay, Maine, and in the Bay of Fundy" (Harger). In Canadian waters it has been taken by the U.S. Fish Commission in 1872, in the Bay of Fundy, at two localities; and in 1877, off Halifax, Nova Scotia; also by the writer in 1873, on the Egmont Bank, a small rocky patch to the N.E. of Shediac Bay, in $4\frac{1}{2}$ fathoms, with the preceding species.

IODTEA ROBUSTA, Kröyer.

From the south shore of Long Island, northward to Greenland, often taken swimming free or among masses of sea-weed, sometimes in mid-ocean. In Canadian waters, so far, it has only been taken off Halifax, at the surface, by the U.S. Fish Commission in 1877.

SYNIDOTEA NODULOSA (Kröyer).

Idothea nodulosa, Kröyer (1849).

Synidotea nodulosa, Harger (1878).

Specimens of this species were "dredged off Halifax by the U. S. Fish Commission at several localities in the summer of 1877, in from 16 to 190 fathoms on sandy and rocky bottoms, with red algæ at one locality. A specimen was brought from Georges Banks by Mr. Joseph P. Schemelia, of the schooner Wm. H. Raymond, in the summer of 1879, and Mr. J. F. Whiteaves has sent to the Museum two specimens collected by Mr. G. M. Dawson, in 111 fathoms, Dixon Entrance, north of Queen Charlotte Island, British Columbia." "The range of the species would therefore be, as at present known, from Georges Banks to Greenland and the Arctic seas, and southward on the Pacific coast as far as British Columbia" (Harger). The "several localities" off Halifax, are elsewhere stated to be: off Halifax, N.S., in 16 fathoms; 120 miles south of Halifax, in 190 fathoms; and Halifax, outer harbour, in 18 and 16 fathoms.

SYNIDOTEA BICUSPIDA (Owen).

Idotea bicuspidata, Owen (1839).*Idotea marmorata*, Packard (1867).*Synidotea bicuspidata*, Harger (1879).

" Gulf of St. Lawrence, on the Orphan Bank, dredged by the writer in 1873 ; Sloop Harbour, Kyustar buck Bay, Labrador (Packard). The species has also been taken on the Grand Banks of Newfoundland.

EPELYS MONTOSUS (Stimpson).

Idotea montosa, Stimpson (1853).*Epelys montosus*, Harger (1874).

Grand Manan, " taken in deep water on sandy and muddy bottoms " (Stimpson). Bay of Fundy and Atlantic coast of Nova Scotia ; U. S. Fish Commission (Harger). Strait of Northumberland, off Richibucto, N.B., in 14 fathoms, dredged by the writer in 1873.

Family *Arcturidae*.

ARCTURUS BAFFINI, Westwood.

Port Burwell, Cape Chudleigh, Hudson Strait, Bell, 1884 ; three specimens, (S. I. Smith).

ASTACILLA GRANULATA (G. O. Sars).

Leachia granulata, G. O. Sars (1877).*Astacilla Americana*, Harger (1878).*Astacilla granulata*, Harger (1879).

" Specimens were first collected on this coast " (i.e. that of New England) on Georges Bank, in the summer of 1877, and the three then obtained were found adhering to *Primnoa*, and had been dried and somewhat broken. " Better specimens were collected adhering to the cable of the schooner Marion, at Banquereau, N.S., by Captain J. W. Collins, August 25, 1878, and a fine specimen was obtained in 7 fathoms off Miquelon Island, south of Newfoundland, by Capt. C. D. Murphy and crew of the schooner Alice M. Williams, July 3, 1879." (Harger).

Family *Limnoriidae*.

LIMNORIA LIGNORUM (Rathke).

Cynothoa lignorum, Rathke (1799).*Limnoria terebrans*, Leach (1813-14).*Limnoria lignorum*, White (1857).

Found by the U. S. Fish Commission, boring in submerged wood, in the Bay of Fundy, in 1872; and at Halifax, N.S., in 1877 (Harger). It had previously been taken by the writer (in 1869) in the Gulf of St. Lawrence, in waterlogged wood dredged in Gaspé Bay.

Family *Cirolanidae*.

CIROLANA POLITA (Stimpson).

Aga polita, Stimpson (1853).*Conilera polita* Harger (1874).*Cirolana polita*, Harger (1879).

"Dr. Stimpson's specimens were found on the fine sands at low-water mark on High Duck Island in the Bay of Fundy, and the specimens that I have examined are from Cape Cod Bay, from near Salem, Mass; Georges Banks, and east of Banquereau, or Quereau, latitude 40° 36' north, longitude 57° 12' west, where seven fine specimens were taken from a halibut (*Hippoglossus*), June 2, 1879, by Capt. J. W. Collins. It appears to replace *C. concharum* at the north" (Harger).

Family *Ægidae*.

ÆGA PSORA (L.).

Oniscus psora, L. (1761); Pennant (1777); and O. Fabricius (1780).*Æga* (*Oniscus psora*) Krøyer (1838).*Æga psora*, Lilljeborg (1850); et auct.

Banquereau, N.S., on halibut and codfish, schooners Marion and Rebecca Bartlett, 1878; Grand Manan Bank, schooner Peter D. Smith, and U. S. Fish Commission, 1878; Brown's Bank, N.S., on codfish, 1878 and 1879 (Harger). North shore of the Gulf of St. Lawrence, collected by Mr. W. Couper in 1872, and identified at the time by the writer. It is probably the species referred to by Packard as "*Æga*, sp. On the belly of cod taken at Caribou Island".* Port Burwell, Cape Chudleigh, Hudson Strait, Bell, 1884; two specimens (S. I. Smith). West coast of Hudson Bay, off the mouth of the Churchill River, in about 20 fathoms, Low, 1897 (Diana exploring expedition).

* Canadian Naturalist and Geologist, vol. VIII., p. 419.

Family *Anthuridae*.

CALATHURA BRACHIATA (Stimpson).

Anthura brachiata, Stimpson (1853).*Paranthura brachiata*, Harger (1879).*Calathura brachiata*, Stebbing (1900).

Grand Manan, "dredged on a shelly and somewhat muddy bottom in 20 fathoms, off the northern point of Duck Island" (Stimpson). Bay of Fundy, down to 80 fathoms on muddy, shelly and sandy bottoms; and off Nova Scotia, eighteen to twenty-two miles south-east from Cape Sable, in 56 to 59 fathoms (Harger). Gulf of St. Lawrence, dredged by the writer in 1872, off Cap des Rosiers, in 110 fathoms; and in 1873, about half way between the Gaspé peninsula and the Island of Anticosti, in 200 fathoms, mud.

PTILANTHURA TENUIS, Harger.

Taken by Prof. A. E. Verrill, in 1870, at Grand Manan, in the Bay of Fundy (Harger).

Family *Gnathiidae*.

GNATHIA CERINA (Stimpson).

Praniza cerina, Stimpson (1853).*Anoeus Americanus*, Stimpson (1853).*Gnathia cerina*, Harger (1879).

Grand Manan, "dredged on a sandy bottom, in 10 fathoms, off Cheney's Head" (Stimpson). Bay of Fundy, in many localities, 10 to 60 fathoms, rocks, stones and mud, and young specimens have been taken adhering to codfish and the sculpin; off Sable Island, N.S., in 160 fathoms, U. S. Fish Commission, 1878 (Harger). Gulf of St. Lawrence, eighteen miles east of Cape Gaspé, in 220 fathoms, mud, dredged by the writer in 1873. Chateau Bay, Long Island, Labrador, at a depth of 15 fathoms, on a sandy bottom (Packard).

Family *Tanaidae*.

LEPTOCHELIA FILUM (Stimpson).

Tanais filum, Stimpson (1853); and Packard (1867).*Leptochelia filum*, Harger (1879).

Grand Manan, "dredged among *Ascidia callosa*, in 20 fathoms, in the Hake Bay" (Stimpson). "Dredged at Caribou Island, in 8 fathoms, on a sandy bottom. Rare" (Packard).

THORACOSTRACA.

With the exception of the American lobster, the *Calocaris*, *Munidopsis* and *Chionocetes*, all of the stalk-eyed crustacea that were dredged by the writer in 1871, 1872 and 1873 in the Gulf of St. Lawrence, were determined or described many years ago by Professor S. I. Smith. In the following pages most of the quotations to which Professor Smith's name is appended, or statements made on his authority, are extracted from his memoir on "The Stalk-eyed Crustaceans of the Atlantic coast of North America north of Cape Cod," published in the Transactions of the Connecticut Academy of Arts and Sciences for May 1879 (vol. v., pp. 27-136). The remainder of these quotations, which refer exclusively to the species collected by Dr. Packard and the Stearns expedition, are taken from Professor Smith's "List of the Crustacea dredged on the coast of Labrador under the direction of W. A. Stearns, in 1882;" and "Review of the Marine Crustacea of Labrador," both published in 1883, in the sixth volume of Proceedings of the U. S. National Museum. Professor Smith's "Report on the Decapod Crustacea in the Albatross dredgings off the east coast of the United States during the summer and autumn of 1884, published in 1886, in the Report of the U. S. Fish Commission for 1885, contains some interesting additional notes on the genus *Munidopsis*.

CUMACEA.

Family *Leuconidae*.

LEUCON NASICUS, Kröyer.

Gulf of St. Lawrence, between Grand Pabou and Cap d'Espoir, in 50 fathoms; also between Cap d'Espoir and the south side of Bonaventure Island, in 70 fathoms, dredged by the writer in 1873 (S. I. Smith). Greenland (Kröyer).

LEUCON NASICOIDES, Lilljeborg.

Gulf of St. Lawrence, dredged by the writer in 1873; one female (S. I. Smith).

EUDORELLA EMARGINATA (Kröyer).

"Off Halifax, Nova Scotia, 52 fathoms, fine sandy mud," U. S. Fish Commission, 1877,—"two specimens, male and female. Entrance of Gaspé Bay, 30 fathoms," dredged by the writer in 1873 (S. I. Smith).

EUDORELLA HISPIDA, G. O. Sars.

"Bay of Fundy," U. S. Fish Commission, 1872, "abundant in 1 to 4 fathoms, very soft mud,—both males and females" (S. I. Smith, 1879).

EUDORELLA PUSILLA, G. O. Sars.

"Bay of Fundy," U. S. Fish Commission, 1872, "very abundant in 1 to 4 fathoms, very soft mud, also in 10 to 15 fathoms, mud;" and Gulf of St. Lawrence, dredged by the writer in 1873 (S. I. Smith).

EUDORELLA INTEGRALIS, S. I. Smith.

1879. Trans. Conn. Acad. Arts and Sc., vol. v., p. 116.

"Off Halifax, Nova Scotia," U. S. Fish Commission, 1877; "females carrying eggs common, 42 fathoms, fine sand, and 52 fathoms, sandy mud; also two females from 57 fathoms, stones, sponges and red algæ. About thirty miles south of Halifax, 110 fathoms, fine sandy mud. Gulf of St. Lawrence, 1873 (J. F. Whiteaves): both males and females, south of the eastern part of Prince Edward Island, and in 70 fathoms, off the Bay of Chaleurs" (S. I. Smith, 1879; op. cit. supra, p. 118).

Family *Diastylidae*.

DIASTYLIS LUCIFERUS (Kröyer).

Cuma lucifera, Kröyer (1841).

Diastylis lucifera, Danielssen (1858).

"Bay of Fundy, 60 and 77 fathoms mud, off Head Harbour, August 16," U. S. Fish Commission, 1872. "About ten miles north of Shediac, Gulf of St. Lawrence," in 10 fathoms, sand, J. F. Whiteaves, 1873 (S. I. Smith, 1879; op. cit., p. 112).

DIASTYLIS RATHKII (Kröyer).

Cuma Rathkii, Kröyer (1841).

Diastylis Rathkii, Bate (1856).

Alauna Goodsiri, Packard (1867).

"Off Halifax, Nova Scotia," U. S. Fish Commission, 1877, "42 fathoms, fine sand, five males, six females; 52 fathoms, fine sandy mud,—one male, seven females; 57 fathoms, gravel and stones,—one specimen. Also just off Chebucto Head, Halifax, 1872, 20 fathoms, soft mud and fine sand—young only. Gulf of St. Lawrence, 1871, 1872 and 1873, Whiteaves" (S. I. Smith, 1879; op. cit., p. 207). Belles Amours, (on the northern side of the Strait of

Belle Isle) in 6 fathoms ; Henley Harbour, 8 fathoms ; Square Island (Labrador) 15 to 30 fathoms ; Cateau Bay, Long Island, 15 fathoms, sand ; and Thomas Bay, 15 fathoms mud (Packard). Fox Harbour, Labrador, in 3 fathoms, Stearns expedition, (S. I. Smith).

DIASTYLIS QUADRISPINOSUS, G. O. Sars.

Cuma bispinosa, Stimpson (1853).

Diastylis quadrispinosus, G. O. Sars (1871).

Grand Manan, "dredged in 35 fathoms, gravel, in the Hake Bay" (Stimpson). "Bay of Fundy, 1868, 1870, 1872. In 1872 it was also dredged in vast numbers at Eel Cove, Grand Manan, in 8 to 10 fathoms, sand, by Prof. H. E. Webster. Off Cape Sable, Nova Scotia, 75 fathoms, fine sand and mud, 1877. In and near Halifax Harbour, Nova Scotia, 1872, 1877: 20 fathoms, soft mud and sand ; 16 and 18 fathoms, fine sand and red algæ ; 21 fathoms, sand, stones and algæ ; 42 fathoms, fine sand ; 52 fathoms, fine sandy mud. Also, about 120 miles south of Halifax, 190 fathoms, gravel and pebbles, 1877" (S. I. Smith, 1879 ; op. cit., p. 113). Northumberland Strait, at several localities ; and eight miles N.E. of Cape George, Nova Scotia, in 10 fathoms, sand, dredged by the writer in 1873.

"Upon the coast of northern New England, this is by far the most abundant species of the genus. It is undoubtedly the species which Stimpson called *Cuma bispinosa*, but his description is wholly insufficient to characterize the species, and I therefore prefer to retain the more appropriate name proposed by G. O. Sars, who has described and figured the species most admirably. Prof. Sars has identified specimens which I have sent to him from different localities on the New England coast" (S. I. Smith, 1879 ; op. cit., p. 113).

DIASTYLIS SCULPTUS, G. O. Sars.

"Bay of Fundy: found at low-water mark, in sandy mud, 1868 ; at the surface, at low-water mark, and in 4 fathoms very soft mud, 1872 ; also in 60 fathoms, mud, off Head Harbour. "Near Halifax, Nova Scotia, in company with *D. Rathkii* and *D. quadrispinosus*, 20 fathoms, soft mud and fine sand, 1872. Halifax Harbour, 16, 18 and 21 fathoms, fine sand, stones and red algæ, 1877. About one hundred and twenty miles south of Halifax, 190 fathoms, gravel and pebbles, 1877, ten large females, all carrying eggs. Northumberland Strait, Gulf of St. Lawrence," about ten miles north of Shediac, "in 10 fathoms sand, J. F. Whiteaves," 1873 (S. I. Smith, 1879 ; op. cit., pp. 111 and 112).

DIASTYLIS POLITUS, S. I. Smith.

1879. Trans. Conn. Acad. Arts and Sc., vol. v., p. 108.

"Halifax, Nova Scotia, 18 to 20 fathoms, fine sand, stones and red algae, 1877. Also one hundred and twenty miles south of Halifax, 190 fathoms, gravel and pebbles, 1877,—two egg-bearing females. Northumberland Strait, Gulf of St. Lawrence, 1873, J. F. Whiteaves" (S. I. Smith, op. cit. supra, p. 111).

SCHIZOPODA.

Family *Mysidæ*.

MYSIS OCULATA (Fabricius).

Cancer oculatus, O. Fabricius (1780).*Mysis oculata*, Kröyer.*Mysis spinulosus*, Packard (1863).*Mysis oculata*, Packard (1867).

Near Caribou Island. "It swarms in tidal pools. The sea trout feed on it. Abundant along the whole coast (of Labrador). The young go in schools and the sea trout consume great numbers of them" (Packard). Dead Island, Labrador coast, Stearns expedition, 1882, a few fragments; and Port Burwell, Hudson Strait, Bell, fragments of a single specimen (S. I. Smith).

"Stimpson (Marine Invertebrata of Grand Manan, p. 58) reports this species (with an ?) as "very abundant in the waters of the Bay of Fundy, swimming near the surface in swarms." "I have never seen specimens from the Bay of Fundy, and, during several seasons spent there, I have never observed any species of *Mysis* swimming at the surface, as described by Stimpson. *Thysanopoda Norvegica* and *inermis*, however, were found in vast numbers in precisely the same way as the *Mysis* is said by Stimpson to occur, and it is possible that Stimpson, without making a special examination, mistook the vast swarms of *Thysanopoda* for *Mysis oculata*" (S. I. Smith, 1879; op. cit., p. 106).

MYSIS STENOLEPIS, S. I. Smith.

1873. Rep. U. S. Fish Comm. for 1871 and 1872, p. 551.

1879. Trans. Conn. Acad. Arts and Sc., vol. v., p. 103.

"Halifax, Nova Scotia, U. S. Fish Commission, 1877: "Outer Harbour, 16 to 21 fathoms, mud and fine sand, stones and red algae; also 18 fathoms, mud and fine sand" (S. I. Smith, 1879).

PSEUDOMMA ROSEUM, G. O. Sars.

Gulf of St. Lawrence, twenty-eight miles E.N.E. of Cape Gaspe, in 110 fathoms; and twenty-five miles E. by N. of Cape Gaspé, in 210 fathoms; several specimens from each of these localities, dredged by the writer in 1873.

PSEUDOMMA TRUNCATUM, S. I. Smith.

1879. Trans. Conn. Acad. Arts and Sc., vol. v., p. 99.

Gulf of St. Lawrence, about half-way between the Bradelle Bank and Miscou Island, in 45 fathoms, one male; also a little to the north of the Baie des Chaleurs, between Grand Pabou and Cap d'Espoir, in 50 and 70 fathoms,—between 20 and 30 specimens; dredged by the writer in 1873.

METERYTHROPS ROBUSTA, S. I. Smith.

1879. Trans. Conn. Acad. Arts and Sc., vol. v., p. 98.

Gulf of St. Lawrence, a little to the north of the Baie des Chaleurs, with the preceding, in 50 and 70 fathoms; an adult male and two females, dredged by the writer in 1873. Two young males and a young female of this species have since been dredged by the U. S. Fish Commission in Massachusetts Bay, off Salem, in 33 fathoms (S. I. Smith).

Family *Euphausiidae*.

NYCTIPHANES NORVEGICA (M. Sars).

Thysanopoda Norvegica, M. Sars (1856).

Nyctiphanes Norvegica, G. O. Sars (1883).

"Bay of Fundy, 1864, 1868, 1870, 1872, 1876: in great abundance at the surface, and often brought up in the dredge. Off Cape Sable, Nova Scotia, 59, 88 and 115 fathoms, sand, gravel and stones, sandy mud, sand and gravel, 1887" (S. I. Smith, 1879; Trans. Conn. Acad. Sc. and Arts, vol. v., p. 89). Gulf of St. Lawrence, 210 fathoms, mud, S. of the S.W. Point of Anticosti, dredged by the writer in 1873.

"Since this, as well as the next species, is essentially pelagic, swimming in vast numbers at the surface, and doubtless at great depths as well, it is of course somewhat uncertain whether the specimens taken in the dredge really come from the bottom or from some point between that and the surface. It was found in the stomachs of the hake taken in the Bay of Fundy, in 1872, however, which is very good evidence that it lives at the bottom for a part of the time.

"In the Bay of Fundy it occurs at the surface in vast swarms, filling the water for miles, and is usually accompanied by schools of mackerel, young

pollock, and other fish, and in the autumn by immense flocks of gulls; the fish and smaller gulls appearing to feed almost exclusively upon the *Thysanopoda* at such times. It not infrequently occurs in this way in the harbour of Eastport, Maine, and with a hand-net, may be caught by the quart even from the wharves. I have observed it only in August, September and October, but Messrs. Merriam and Wilson found it in abundance in April. Professor Verrill observed it in 1859, swarming in myriads at the "Ripplings," in the centre of the Bay of Fundy" (S. I. Smith, 1879; op. cit., pp. 89 and 90). In a letter from Professor Smith, received October 6, 1891, he says, also, that he has had both this and the next species "from the stomachs of herring, mackerel and other fish." Four specimens, which Professor Smith has identified with *N. Norvegica*, were sent to the writer in 1891 by Lieut. Gordon, R.N., (per Colonel Tilton) labelled as crustaceans, "which to a great extent form the food of the herring in the Bay of Fundy."

RHODA INERMIS (Kröyer).

Thysanopoda inermis, Kröyer (1849).

Rhoda inermis, Stebbing (1893).

Bay of Fundy, at the surface, 1864, 1868, 1872; dredged in 40 to 50 fathoms, rocky, 1868; and found in the stomachs of pollock and hake, 1872" (S. I. Smith, 1879; op. cit., p. 92).

Gulf of St. Lawrence, between Grand Pabou and Cap d'Espoir, in 50 and 70 fathoms; also between Anticosti and the Gaspé peninsula, in 210 and 220 fathoms; dredged by the writer in 1873.

DECAPODA.

MACRURA.

Family *Pandalidae*.

PANDALUS MONTAGUI, Leach.

Pandalus Montagu, Leach (1813 or 1814).

Pandalus annulicornis, Leach (1815).

Pandalus levigatus, Stimpson (1853); fide S. I. Smith.

One of the commonest of the large shrimps of the region under consideration. On the Atlantic coast of North America, it is known to range from Vineyard Sound, Mass., and Newport, R.I., northward to Greenland; and in depth, from 6 to 90 fathoms. In Canadian waters, it has been dredged in the Bay of Fundy by Stimpson and by Verrill; on the Atlantic coast of Nova Scotia by the U. S. Fish Commission; in the Gulf of St. Lawrence, at many localities, by the writer; in the Strait of Belle Isle, and on the Labrador coast by Packard and the Stearns expedition; and in Hudson Strait and Bay by Bell and Low.

PANDALUS BOREALIS, Kröyer.

"Twenty to thirty miles south east to south east one-half east from Cape Sable, Nova Scotia, 59 to 88 fathoms, fine sand, pebbles and rocks," U. S. Fish Commission, 1877, "two small specimens. About thirty miles south to south by west one-fourth west from Halifax, Nova Scotia, 85 to 110 fathoms, fine sand and mud, 1877. "Massachusetts Bay, off Salem; Gulf of Maine, Casco Bay; and Nova Scotia to Greenland; in from 50 to a little over 100 fathoms (S. I. Smith, 1879; op. cit., p. 86.)

HIPPOLYTE FABRICII, Kröyer.

Salem Harbour, Mass., northward to Labrador and Greenland, in from 5 to 64 fathoms.

"Bay of Fundy, 1864, 1868, 1870, 1872,—5 to 40 fathoms, but not found in so great abundance as in Casco and Massachusetts Bays. . . . "Halifax, Nova Scotia," U. S. Fish Commission, 1877, "common in 16 to 21 fathoms, stones, sand and red algæ; in 18 to 25 fathoms, shingly, gravelly, sandy and muddy bottoms; and 16 fathoms, mud, at the mouth of Bedford Basin; and a single specimen, in company with *H. macilenta*, in 35 fathoms, very soft mud, in Bedford Basin itself. Also off Halifax, 52 fathoms, sand, mud and rocks, and 57 fathoms, gravel and stones, 1877" (S. I. Smith, 1879; op. cit., p. 64). Gulf of St. Lawrence, opposite Cap des Rosiers lighthouse, six miles from shore, in 125 fathoms, dredged by the writer in 1871. Coast of Labrador, at Domino Harbour, "not common" (Packard); at Forteau Bay, L'Anse au Loup, Henley Harbour, Fox Harbour, and Dead Island,—Stearns expedition (S. I. Smith). Entrance to Hudson Strait, at Port Burwell, Cape Chudleigh, Bell (S. I. Smith).

HIPPOLYTE MACILENTA, Kröyer.

On the western side of the Atlantic the known range of this species is from the outer coast of Nova Scotia to Labrador and Greenland, in from 15 to 70 fathoms. It is recorded as having been taken at the following localities: "Bedford Basin, Halifax, Nova Scotia, 26 to 41 fathoms, soft mud, common," U. S. Fish Commission, 1887. "Also off Halifax, 42 fathoms, fine sand; 52 fathoms, fine sand and mud; and 57 fathoms, mud and pebbles (S. I. Smith 1879; op. cit., p. 71). Gulf of St. Lawrence, eight miles S.E. of Bonaventure Island, in 56 fathoms, and fifteen miles S.S.E. of Bonaventure Island, in 50 fathoms,—dredged by the writer in 1872; also between the Bradelle Bank and Miscou Island, in 45 fathoms, and between Grand Pabu and Cap d'Espoir, in 50 and 70 fathoms, dredged by the writer in 1873. Coast of Labrador,—"a rare form, dredged at Square Island at a depth of 15 to 30 fathoms" (Packard).

HIPPOLYTE PROJECTA, Spence Bate.

1888. H.M.S. Challenger Reports, Zoology, vol. xxiv., p. 594.

H.M.S. Challenger, Station 49 (May 20, 1873) south of Halifax, in 85 fathoms (Bate).

SPIRONTOCARIS SPINUS (Sowerby).

Cancer spinus, Sowerby (1805).

Hippolyte Sowerbati, Leach (1817).

Hippolyte spinus, Owen (1835); and S. I. Smith (1879).

Hippolyte Sowerbyi, M. Edwards (1837).

Hippolyte securifrons, Norman (1861); fide Bate.

Spirontocaris spinus, Bate (1888).

According to Professor Smith, this species has been dredged at Grand Manan and elsewhere in the Bay of Fundy by Professor Verrill and the U. S. Fish Commission; also at three localities on the Atlantic coast of Nova Scotia, and on the Le Have Bank by the U. S. Fish Commission. It has also been dredged south of Halifax (Station 49) by H.M.S. Challenger. In the Gulf of St. Lawrence *S. spinus* has been dredged at many localities by the writer; and in the Strait of Belle Isle and Atlantic coast of Labrador, by Packard and the Stearns expedition. On the east coast of North America it is known to range from off Salem, Massachusetts Bay, northward to Labrador, Greenland (Valorous and Porcupine expeditions) Grinnell Land and as far north as lat. 81° 44' (Miers), and in depth from 5 to 90 fathoms. Professor Smith also says that *Hippolyte spinus* is "by far the most abundant species of the genus on the New England coast."

SPIRONTOCARIS GRÆNLANDICA (J. C. Fabricius).

Astacus Grænlædicus, J. C. Fabricius (1775).

Cancer aculeatus, O. Fabricius (1780).

Hippolyte aculeata, J. C. Ross (1835); and Gould (1841).

Hippolyte Grænlædica, Miers (1877); and S. I. Smith (1879).

Spirontocaris Grænlædica, Stebbing (1900).

Grand Manan, "very common in the laminarian zone" (Stimpson). "Grand Manan, Bay of Fundy, 1872; also off Flagg's Cove, Grand Manan, 15 fathoms, shells, mud and stones, 1873. "Halifax, Nova Scotia, 1877; 16 fathoms, stones, sand and red algæ; 18 fathoms, fine sand, also mud and fine sand; 21 fathoms, fine sand and red algæ; and 25 fathoms gravel" (S. I. Smith, 1879; op. cit., p. 85). North shore of the mouth of the River St. Lawrence, at Murray Bay, Sir J. W. Dawson (S. I. Smith). Caribou Island, P.Q.; Strait of Belle Isle, 10 fathoms; Square Island, Labrador coast, 15 to 30 fathoms; and Domino Harbour, Labrador, 7 fathoms (Packard). L'Anse au Loup, Strait of Belle Isle, 10 to 15 fathoms; Fox Harbour, St. Lewis Sound,

Labrador, 1 fathom; and Dead Island, near Square Island, Labrador, in 1 to 4 fathoms; Stearns expedition (S. I. Smith). Port Burwell, Cape Chudleigh, Hudson Strait, Bell (S. I. Smith). On the western side of the Atlantic *S. Greenlandica* is known to occur from Massachusetts Bay, off Salem, to Hudson Strait, Greenland and Grinnell Land, as far north as $82^{\circ} 30'$ (Miers); and in depth, to range from 1 to 33 fathoms, or more.

SPIRONTOCARIS POLARIS (Sabine).

Alpheus polaris, Sabine (1824).

Hippolyte polaris, Owen (1835).

Spirontocaris polaris, Norman (1894).

Specimens which Professor S. I. Smith has identified with this species have been dredged in the Bay of Fundy by Professor Verrill in 1870, and the U. S. Fish Commission in 1872; at several localities on the Atlantic coast of Nova Scotia, in from 16 to 100 fathoms, by the U. S. Fish Commission in 1877; in the Gulf of St. Lawrence, off Cap des Rosiers lighthouse, in 35 fathoms, by the writer in 1871; in the Strait of Belle Isle and Atlantic coast of Labrador, by Packard and the Stearns expedition; and in Hudson Strait, at Port Burwell, Cape Chudleigh, by Bell. To the southward and northward of these localities its geographical range appears to be essentially the same as that of the two preceding species.

SPIRONTOCARIS TURGIDA (Kröyer).

Hippolyte turgida, Kröyer (1841).

Hippolyte Phippsi, Kröyer (1841).

Spirontocaris turgida, Stebbing (1900).

Grand Manan, Bay of Fundy, 1872 (Prof. H. E. Webster). "Halifax, Nova Scotia," U. S. Fish Commission, "1877: 10 fathoms, fine sand and red algæ; 18 fathoms, fine sand; 25 fathoms, rocks and nullipora; 25 fathoms, gravel; and 26 to 41 fathoms, soft mud, in Bedford Basin" (S. I. Smith, 1879; op. cit., p. 73). Gulf of St. Lawrence, dredged by the writer in 1871, about half-way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms, and off Cap des Rosiers lighthouse, in 125 fathoms; also, in 1873, on the Orphan Bank. Strait of Belle Isle, off Belles Amours, in 10 fathoms, on a rocky bottom (*H. turgida*); and Domino Harbour, Labrador coast (*H. Phippsi*) at a depth of 7 fathoms (Packard). L'Anse au Loup, Strait of Belle Isle, in 8 fathoms, Stearns expedition (S. I. Smith). Port Burwell, Cape Chudleigh, Hudson Strait, Bell (S. I. Smith).

On the western side of the Atlantic, this species is known to range from Massachusetts Bay (off Salem) to the Arctic Ocean, as far north as lat. $81^{\circ} 44'$, and in depth from 10 to 125 fathoms.

SPIRONTOCARIS PUSIOLA (Kröyer).

Hippolyte pusiola, Kröyer (1842).*Spirontocaris pusiola*, Norman (1894).

" Bay of Fundy, 1864, 1868, 1870, 1872, 1876 : not uncommon at low-water mark, among stones and algæ ; common in 5 to 50 fathoms, rocky, gravelly and shelly bottoms ; off White Head, Grand Manan, 97 to 105 fathoms, gravelly, 1872. " Le Have Bank, 45 fathoms, gravel and stones, 1872—abundant. Halifax, Nova Scotia, 1877 ; 16 fathoms, rocky ; 18 fathoms, fine sand ; 25 fathoms, gravel ; and one specimen also from 16 fathoms, mud." Gulf of St. Lawrence, Orphan Bank, and, in 10 fathoms, gravel, stones and broken shells, off Sea Cow Head, Prince Edward Island, 1873 ; J. F. Whiteaves " (S. I. Smith, 1879 ; op. cit., p. 77). Off Nova Scotia, in 49 fathoms, SS. Albatross dredgings of 1883 (Verrill). On the Atlantic coast of North America the known range of this species is from Long Island Sound to the Orphan Bank, and from low-water mark to 105 fathoms.

SPIRONTOCARIS GAIMARDII (Milne Edwards).

Hippolyte Gaimardii, Milne-Edwards (1837).*Hetaurus Gaimardii*, Spence Bate (1888).*Spirontocaris Gaimardii*, Stebbing (1893).

" Halifax, Nova Scotia, 16 and 21 fathoms, stones, sand and red algæ, and 18 fathoms, fine sand and mud, U. S. Fish Commission, 1877. Also, off Halifax, 52 fathoms, mud and fine sand, and 57 fathoms mud and pebbles, September, 1877,—one specimen from 57 fathoms, carrying eggs " (S. I. Smith, 1879 ; op. cit., p. 67). H.M.S. Challenger, Station 49, south of Halifax, in 85 fathoms (Bate). Gulf of St. Lawrence, eight miles S.E. of Bonaventure Island, in 56 fathoms,—and fifteen miles S.S.E. of Bonaventure Island, in 50 fathoms, dredged by the writer in 1872 ; Caribou Island, in 15 fathoms (Packard). Taken also in the Strait of Belle Isle, and on the Labrador coast, by Packard and the Stearns expedition.

S. Gaimardii is known to range from Boston Harbour, to the Arctic Ocean north to lat. 79° 29', and from near low-water to 60 fathoms in depth.

HETAIRUS TENUIS, Spence Bate.

1888. H.M.S. Challenger Reports, Zoology, vol. xxiv., p. 614.

H.M.S. Challenger, Station 49, south of Halifax, in 85 fathoms (Bate).

HETAIURUS DEBILIS, Spence Bate.

1888. H.M.S. Challenger Reports, Zoology, vol. xxiv., p. 615.

With the preceding. This species "appears to me to form a link in a series by which extreme forms are united, or it may be only a younger form. of *Hetairus tenuis*" (Bate).

Family *Crangonidae*.

CRANGON VULGARIS, J. C. Fabricius.

Throughout the entire region, at or near low-water mark to a depth of about 50 fathoms. The most northerly locality at which this, the common edible shrimp of the north Atlantic, has been collected on the coast of eastern North America, is Caribou Island, where Packard says it is large and abundant on the mud flats. The most southerly locality at which it has been taken on the same coast, is at Fort Macon, North Carolina. So far as the writer is aware, this species is not used for food in eastern Canada, as it is so largely in the British Islands and northern Europe, nor is it yet known whether it could be caught in the Maritime Provinces or Gulf of St. Lawrence in sufficiently large numbers to be of any economic value.

SCLEROCRANGON BOREAS (Phipps).

A more northerly species than the preceding. It is known to range from Massachusetts Bay, off Salem, to the Arctic Ocean as far north as lat. 81° 44', and, in depth, from low-water mark to 33 fathoms. In the waters of eastern Canada, it has been taken at the following localities. Grand Manan, "dredged in 4 fathoms, on a nullipore bottom, near the Passage, and in 20 fathoms, shelly, off Duck Island ledge" (Stimpson). "Bay of Fundy, occasionally taken among rocks at low water; common in 5 to 25 fathoms, rocky, gravelly, and shelly bottoms; and abundant at special localities in Johnson's and South Bays, in 10 to 15 fathoms, on rocky bottoms overgrown with sponges, ascidians, hydroids, algæ, etc.; 1864, 1868, 1870, 1872, 1876. Halifax, Nova Scotia, 1877; 18 fathoms fine sand; 20 fathoms shingly; and 25 fathoms gravelly" (S. I. Smith, 1879; op. cit., pp. 56 and 57). Gulf of St. Lawrence, on the Orphan Bank; and off Cape Bon Ami, P.Q., in 30 fathoms; dredged by the writer in 1873. Caribou Island, 8 fathoms; Square Island, 30 fathoms; Henley Harbour, 10 fathoms; and whole coast of Labrador (Packard). L'Anse au Loup, 3 to 8 fathoms; Henley Harbour; and Dead Island near Square Island (Labrador) in 1 to 3 fathoms; Stearns expedition (S. I. Smith). Port Burwell, Cape Chudleigh, Hudson Strait, Bell, 1884 (S. I. Smith).

SABINEA SEPTEMCARINATA (Sabine).

Orangon septemcarinatus, Sabine (1824).

Sabinea septemcarinata, Owen (1835).

"Off Halifax, N.S.," U. S. Fish Commission, "1877, 52 fathoms, fine sand and mud, September 21,—common; 57 fathoms, mud, gravel and stones, September 5—two females, one carrying eggs" (S. I. Smith, 1879; op. cit., p. 59). Gulf of St. Lawrence, fifteen miles S.S.E. of Bonaventure Island, in 50 fathoms; eight miles S.E. of Bonaventure Island, in 56 fathoms; and about eleven miles from Percé, in 60 fathoms; dredged by the writer in 1872. Thomas Bay, Labrador coast, "at a depth of 15 fathoms" (Packard). On the western side of the Atlantic the species is known to range from Massachusetts Bay to the west coast of Davis Strait, and Greenland; and, in depth, from 15 to 85 fathoms.

SABINEA SARSII, S. I. Smith.

1879. Trans. Conn. Acad. Arts and Sc., vol. v., p. 59.

"St. George's Banks, 60 fathoms, shells and sand, 1872,—one young specimen 16 mm. in length. Gulf of Maine, about east south-east from Cape Sable, Nova Scotia, latitude 42° 40' north, longitude 66° 58' west, 112 fathoms, gravel, August 20, 1877,—one female 36 mm. in length. "Le Have Bank, 60 fathoms, coarse gravel, stones and sponges, Sept. 12, 1872, a female, 47 mm. in length, carrying eggs, and a small specimen badly mutilated. Lofoten Islands, coast of Norway (G. O. Sars),—two fine females, 62 and 53 mm. in length" (S. I. Smith, op. cit. supra., p. 60). H.M. S. Challenger, Station 49, 1873, south of Halifax, in 85 fathoms (Spence Bate). Off Nova Scotia, 122 to 150 fathoms, SS. Albatross dredgings of 1883 (S. I. Smith).

In his Report on the Crustacea Macrura obtained on the Challenger expedition (Zoology, vol. xxiv.) Spence Bate includes *S. Sarsii* among the synonyms of *S. septemcarinata*, and regards the former as only a "pronounced variety" of the latter. In support of this contention, he quotes a letter from Professor J. S. Kingsley, in which the following sentence occurs. "Professor Smith and I were at first inclined to call it a new species, but I now consider it (and I think Professor Smith has come to the same conclusion) merely a variety of Sabine's species." But, in a letter to the writer, dated Nov. 21, 1900, Professor Smith thus expresses his views on this point. "At the time Spence Bate's volume of the Challenger Reports was published I re-examined the relation of *Sabinea Sarsii* to *S. septemcarinata*, and I could see no reason to change my original conclusion that they were distinct species. At that time I had a very large series of both species for comparison. G. O. Sars has from the first recognized the *Sarsii* as a good species.

Prof. Kingsley had no authority whatever from me to state that I regarded the *Sarsi* as a variety, and I 'think' he had never seen many specimens of the two forms when he wrote the letter to Bate."

PONTOPHILUS NORVEGICUS, M. Sars.

Crangon Norvegicus, M. Sars (1861).

Pontophilus Norvegicus, M. Sars (1861).

"Off the coast of Nova Scotia, about thirty miles south of Halifax, 101 fathoms, fine sand, and 110 fathoms, fine sand and mud," U. S. Fish Commission, 1877 (S. I. Smith, 1879; op. cit., p. 61). On the North American coast it has also been dredged in the Gulf of Maine.

NECTOCRANGON LAR (Owen).

Argis lar (Owen) Packard (1863 and 1867).

Nectocrangon lar (Brandt ex Owen) S. I. Smith (1879).

Taken by the U. S. Fish Commission in 1877," about twenty miles south-east from Cape Sable, Nova Scotia, in 59 fathoms; in Bedford Basin, Halifax, in 26 to 41 fathoms; and about 10 miles off Halifax, in 52 fathoms (S. I. Smith, 1879; op. cit., p. 61). Gulf of St. Lawrence, dredged by the writer in 1873 on the Bradelle and Orphan banks, also (in 1872) eight miles S.E. of Bonaventure Island, in 56 fathoms; and by Packard, in 1860, off Caribou Island, in 10 fathoms. Square Island, Labrador, in 30 fathoms (Packard); Henley Harbour, Strait of Belle Isle, in 10 fathoms; and Dead Island (near Square Island) Labrador; Stearns expedition, (S. I. Smith). On the North American coast, the geographical range of this species is from Nova Scotia to the Arctic Ocean, and its range in depth from 10 fathoms, or less, to 60 fathoms.

CARIDION GORDONI (SPENCE BATE).

Hippolyte Gordoni (Bate) Norman.

Caridion Gordoni, Gies (1863).

Bay of Fundy, 40 to 50 fathoms, rocky, Aug. 14, 1868,—a female carrying eggs; and off White Head, Grand Manan, 40 to 50 fathoms, 1872 (S. I. Smith, 1879; op. cit., p. 62).

Family *Homaridae*.

HOMARUS AMERICANUS, Milne Edwards.

The American lobster occurs throughout the whole of the region now under consideration, but is rarely if ever taken by the dredge. It is known

to occur as far to the southward as the coast of New Jersey, and to the northward as far as Henley Harbour, Chateau Bay, Labrador, where it was observed by Packard in 1864. At Grand Manan, Stimpson notes that lobsters are "said by the inhabitants to occur in great numbers in May, at Grand Harbour, in holes in the sand just below low water mark. They are easily taken with boat hooks." In Passamaquoddy Bay, Ganong says that lobsters are "quite abundant in the pools near low-water mark, hiding in cavities under ledges." Off Pictou Island and at several localities in the Gulf of St. Lawrence, the writer has frequently taken very young living specimens, less than an inch in length, in a towing net, among masses of *Fucus* and other coarse sea weeds drifted from near the shore. The early stages of the American lobster have been described in detail by Professor S. I. Smith, in the American Journal of Science and Arts for June, 1872, the paper being descriptive of specimens from Vineyard Sound and the adjacent waters.

In Mr. F. H. Herrick's memoir on "The American Lobster: A Study of its Habits and Development," published in 1895, in the Bulletin of the U. S. Fish Commission, vol. xv., and on p. 117, the following passage occurs, in reference to the size that this species sometimes attains to.

"These notes furnish evidence, if any were needed, that very large lobsters, weighing twenty pounds or more, are even now occasionally taken, but I have never obtained any reliable evidence that lobsters weighing over twenty five pounds have ever been caught. When lobsters are said to have attained a greater weight, measurements of the parts of the skeleton which have been preserved invariably prove that the figures have been exaggerated. I do not maintain that the American lobster does not reach a greater weight than twenty-five pounds, but that I have been unable, up to the present time, to discover any well authenticated evidence that this is the case."

"Many points on the coast of Maine and the Maritime Provinces still furnish large lobsters, weighing ten pounds or more, but not in any considerable number, and lobsters of five pounds weight are frequently common; yet it is at the same time true that the size of the lobster has been declining for many years, until the average weight has, in most places, fallen below two pounds."*

In the Bulletin of the American Museum of Natural History, vol. XII., published in 1900, Professor R. P. Whitfield says that two lobsters, one weighing about thirty-four pounds, and the other about thirty-one, were taken off Atlantic Highlands, New Jersey, in the spring of 1897. And, in the Montreal Daily Witness for June 8, 1901, it is stated that a lobster that "measures four feet from the tip of the claws to the tip of the tail," and "weighs twenty-three pounds, was caught in a trap a few miles off the shore of Grand Manan," in June, 1901.

* For this reference the writer is indebted to Mr. J. Crawford Simpson.

Family *Thaumastochelida*.

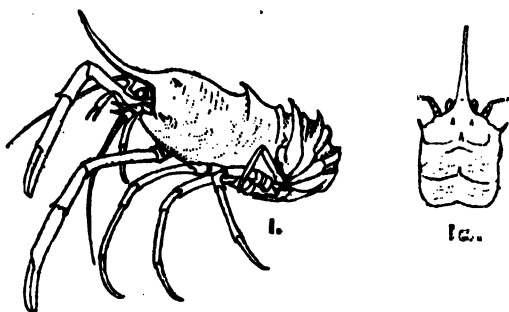
CALOCARIS McANDREAE, Bell.

A fine living specimen of this species was dredged by the writer in 1873, in the Gulf of St. Lawrence, twenty miles to the south-west of the South-West Point of the Island of Anticosti, in 190 fathoms, mud.

Family *Galatheidæ*.

MUNIDOPSIS CURVIROSTRA, Whiteaves.

1874. Amer. Journ. Sc. and Arts, Third Series, vol. VII., p. 212.



Munidopsis curvirostra. Fig. 1, side view of one of the types of this species, in outline; fig. 1a, carapace of the same, as seen from above. Both figures are about one and a half times the natural size.

Original description of the genus and species.

"*Munidopsis curvirostra*, nov. gen. et sp. External antennæ about equal in length to the carapace and its rostrum; internal ones very short, not reaching farther than about one-fourth the length of the beak. Eyes rudimentary, longitudinally oval, light yellowish in colour; cornea devoid of facets. Carapace squarish, but longer than broad, with an outwardly directed straight spine on each of the front angles. Upper surface of the carapace granulate, hispid, transversely irregularly plicate. In the centre* there are two dorsal spines, placed one above the other, but at some distance apart. These, as are two similar spines on the tail segments, are all exactly in a line with the rostrum, and the whole four point forward. Rostrum simple (without the spine on each side of the base so characteristic of *Munida*) conspicuously curved upward, stout at the base and gradually tapering to a fine point. A single spine in the centre of the first and second tail segments, the rest devoid of any. Anterior pair of legs about as long as, but not

* Or, rather,—median line; and in the next line, for "above" read—in advance of.

longer, than from the apex of the rostrum to the end of the tail, extending a little beyond the tips of the outer antennæ. The following are the measurements of an average and apparently adult female: length, from apex of rostrum to tip of tail, 1.38 inch; of carapace, including the rostrum, .69 inch; of exterior antennæ, .75 inch; of anterior legs, .94."

"Inhabits the centre of the mouth of the St. Lawrence River*, between Anticosti and the south shore, in from 180 to 220 fathoms, and probably burrows in the deep sea mud."

"From *Munida* it may at once be distinguished by its curved and simple rostrum. In the rudimentary character of its eyes it closely resembles *Calocaris*, but not in many other respects."

This description was based upon four adult living females, dredged by the writer in 1873. Specimens of both sexes, which have been identified with this species by Professor S. I. Smith, were subsequently dredged by the SS. Albatross, of the U. S. Fish Commission, in 1883 and 1884, in very deep water (75 to 1290 fathoms) off the north-east coast of the United States.

According to Professors Smith†, and J. R. Henderson,‡ *Galacantha*, *Galathodes* and *Orophorhynchus* of A. Milne Edwards, are synonyms of *Munidopsis*.

Family Paguridæ.

EUPAGURUS BERNHARDUS (L.).

Cancer Bernhardus (L.).

Pagurus Bernhardus, J. C. Fabricius (1793); and Gould (1841).

Eupagurus Bernhardus, Brandt (1851).

Bernhardus streblonyx (Dana) Stimpson (1853).

Long Island Sound to Halifax, N.S., from low-water mark to a depth of 86 fathoms (S. I. Smith). Grand Manan (Stimpson). "In the Bay of Fundy, 1864, 1868, 1870 and 1872, it was occasionally found at low water, and was common at the same depths and on similar bottoms as in Casco Bay; also dredged off White Head, Grand Manan, in 40 to 50 fathoms, 1872. "In and near Halifax Harbour, Nova Scotia, 18 to 25 fathoms, sand, gravel stones and sand and red algæ, 1877. I have never seen specimens from the Gulf of St. Lawrence nor Labrador, and can find no record of its occurrence on our eastern coast north of Halifax. I have little doubt, however, that it occurs in the southern part of the Gulf of St. Lawrence" (S. I. Smith, 1879; op. cit., p. 46 and 47).

* Or, more correctly,—the deepest parts of the Gulf of St. Lawrence.

† Proceedings of the U. S. National Museum for 1884, vol. VII., p. 493.

‡ H.M.S. Challenger Reports, Zoology, vol. XXVII., p. 148.

EUPAGURUS PUBESCENS (Kröyer).

Pagurus pubescens, Kröyer (1839).*Eupagurus pubescens*, Brøndt (1851).

Throughout the entire region, from low-water mark to 105 fathoms, its known range on the North American coast being from New Jersey* to Hudson Strait and Greenland. In the Bay of Fundy it has been collected by Dr. W. Stimpson, and the U. S. Fish Commission; on the Atlantic coast of Nova Scotia it has been dredged by H.M.S. Challenger, and the U. S. Fish Commission; in the Gulf of St. Lawrence on the Orphan Bank and elsewhere by the writer; and on the coast of Labrador by Dr. A. S. Packard, and by the Stearns expedition.

EUPAGURUS KROYERI, Stimpson.

The distribution of *E. Kroyeri* seems to be essentially similar to that of the preceding species. Professor S. I. Smith, however, who regards it as distinct from *E. pubescens*, says that it is "apparently a more strictly arctic species." Professor G. O. Sars, (1882)*, and the Rev. Thos. R. R. Stebbing, (1890)† place its name among the synonyms of *E. pubescens*, and Professor J. R. Henderson, in his Report on the Challenger Anomura, quotes *E. Kroyeri* as merely a variety of *E. pubescens*.

PARAPAGURUS PILOSIMANUS, S. I. Smith.

1879. Trans. Conn. Acad. Arts and Sc., vol. v, p. 51.

The type of this species "was taken, probably upon a trawl line, in 250 fathoms, hard bottom, off the coast of Nova Scotia, nearly due south of Halifax," and since then a few additional specimens have been brought in by fishermen from deep water off Nova Scotia. "In all the specimens seen, the carcinoecium is built up by a compound actinoid polyp, as in the specimen first described. Some of the young specimens shew very plainly the gastropod shell, which serves as a nucleus about which the polypean carcinoecium is built" (S. I. Smith, 1881; Proc. U. S. Nat. Mus., vol. III., p. 428). The species has been dredged by the S.S. Fish Hawk, of the U. S. Fish Commission, off the south coast of New England, in from 250 to 372 fathoms, in 1880; and by the S.S. Albatross, a little farther to the south-eastward, in from 353 to 2,021 fathoms, in 1884.

* Forhandlingar Videnskabs-Selskabs Christiania, No. 18, p. 42.

† Annals and Magazine of Natural History, Ser. VII., vol. v., p. 5.

Family *Lithodidae*.

LITHODES MAIA (L).

In 1878, fine specimens of *L. maia* were obtained from off Sable Island, Nova Scotia, in 250 fathoms rocky bottom, by Philip Merchant and Thomas Ginnevan, of the schooner Marion, and presented to the U. S. Fish Commission (S. I. Smith, 1879; Trans. Conn. Acad. Arts and Sc., vol. v., pp. 45 and 46).

BRACHYURA.

Family *Maiadae*.

HYAS ARANEUS (L).

Cancer araneus, L. (1758).

Hyas araneus, Leach (1814); et auct.

On the Nova Scotian coast this species has been dredged by the U. S. Fish Commission, on the Le Have Bank, in 60 fathoms, and off Chebucto Head, in 20 fathoms, in 1872; also in and near Halifax Harbour, in from 16 to 25 fathoms, in 1877. In the Gulf of St. Lawrence, it was found abundantly at Caribou Island by Packard in 1860; in Ellis Bay, Anticosti, in 8 fathoms, rocky bottom, by the Anticosti expedition of 1861; and on the Orphan Bank, entrance to Gaspé Bay, etc., by the writer in 1872 and 1873. On the Atlantic coast of Labrador it was collected by Packard in 1864, and by the Stearns expedition in 1882.

HYAS COARCTATUS, Leach.

Grand Manan, not uncommon in the laminarian zone (Stimpson). "Bay of Fundy, 1864, 1868, 1870 and 1872, rarely taken among rocks at low-water mark, and not uncommon in 10 to 77 fathoms" (S. I. Smith, 1879; op. cit., p. 44). Off Nova Scotia it has been dredged by the U. S. Fish Commission, on the Le Have Bank in 45 and 60 fathoms in 1872; off Cape Negro and off Shelburne, in 47 and 59 fathoms; also in and near Halifax Harbour, in 18 to 57 fathoms; in 1877. In the Gulf of St. Lawrence, where it is a favourite morsel for cod, it has been dredged at Caribou Island by Packard in 1864, and at many other localities by the writer in 1871-73. It has also been collected on the Atlantic coast of Labrador, by Packard and the Stearns expedition.

The Rev. T. R. R. Stebbing, in a paper on Arctic Crustacea, published in the Annals and Magazine of Natural History for January, 1900, doubts whether *H. coarctatus* is more than a variety of *H. araneus*.

CHIONÆCETES OPILIO (O. Fabricius).

Cancer phalangium, O. Fabricius (1780); not of J. C. Fabricius (1775).

Cancer opilio, O. Fabricius (1870); teste Kröyer.

Chionæcetes opilio, Kröyer (1838).

Off Cape Sable, N.S., in 88 fathoms; and about twenty-six miles south of Chebucto Head, in 101 fathoms; U. S. Fish Commission, 1877 (S. I. Smith, 1879; op. cit., p. 41). The species is widely distributed throughout the Gulf of St. Lawrence, though it is rarely taken by the dredge. Fine large specimens are brought up on fishermen's lines at Little Métis, and elsewhere. Sir J. W. Dawson, in his Hand Book of Zoology (1870), speaks of it as the "great spider crab, which is our largest species, sometimes measuring eighteen inches in extreme breadth." Packard says that "a number were taken from the stomachs of cod from the bank" off Caribou Island, in 1860; also, that the species is not uncommon in the Strait of Belle Isle, in 10 to 50 fathoms; and at Chateau Bay, Labrador, in 30 to 50 fathoms."

Family Portunidae.

NEPTUNUS SAYI, Milne Edwards.

Lupa pelagica, Say (1817); nec Linné.

Neptunus Sayi, A. Milne Edwards (1861).

H. M. S. Challenger, Station 49 (May 20, 1873), south of Halifax, Nova Scotia, in 85 fathoms; an adult male of "this common pelagic species" (Edwards).

Family Cancridæ.

CANCER AMÆNUS, Herbst.

Cancer amœnus, Herbst (1799); teste S. I. Smith.*

Cancer irroratus, Say (1817); males only.

Cancer Sayi, Gould (1841).

Cancer borealis, Packard (1867); not Stimpson.

Grand Manan, "found very rarely in cavities among the rocks at low-water" (Stimpson). Bay of Fundy, 1864, 1868, 1870 and 1872, but apparently much less abundant than in Long Island Sound, and on the south coast of New England; and at several localities in and near Halifax Harbour, Nova Scotia, in 16 to 21 fathoms, 1872-1877 (S. I. Smith, 1879; op. cit., p. 38). The common crab of the Gulf of St. Lawrence, which has been collected at many localities in that region by Bell, Packard, the Cambridge Anticosti exploring expedition of 1862, Sir J. W. Dawson, the writer, and

* Annual Report of the U. S. Fish Commission for 1885, Washington, 1886, page 680 (23).

others. Packard records its occurrence at Caribou Island, and states that he was informed that it was found at Hamilton Inlet (Labrador). It is said to occur as far to the southward as South Carolina, where it is "apparently rare."

CANCER BOREALIS, Stimpson.

Cancer irroratus, Say (1817); females only.

Cancer irroratus, Gould (1841); and Stimpson (1853).

Cancer borealis, Stimpson (1859).

Bay of Fundy and Nova Scotia (Stimpson), southward to near Noank, Connecticut (S. I. Smith).

ARACHNIDA.

PYCNOGONIDA (PANTOPODA).

Family *Pycnogonidae*.

PYCNOGONUM LITTORALE (Ström).

Phalangium littorale, Ström (1762).

Pycnogonum littorale, O. Fabricius (1780).

Pycnogonum pelagicum, Stimpson (1853).

"On our coast" this species "ranges, so far as now known, from Long Island Sound to the Gulf of St. Lawrence (Whiteaves), though its occurrence south of Cape Cod is exceptional. In the Bay of Fundy it is not uncommon under stones at low-water mark, and it extends down to 430 fathoms. It is sometimes found clinging to actinias; at Eastport, Maine, seventeen specimens were taken from *Bunodes stella*, growing on the rocks near low-water mark; and off Cape Sable, N.S., they were found in considerable numbers attached to the base of *Bolocera Tuedia*" (Dr. E. B. Wilson).* In the Gulf of St. Lawrence seven specimens of *P. littorale* were dredged by the writer, in 1871, off East Cape, Anticosti, bearing S. by W., twenty-four miles distant, in 212 fathoms, mud.

Family *Achelidae*.

ACHELIA SPINOSA (Stimpson).

Zetes spinosa, Stimpson (1853).

Achelia spinosa, Wilson (1878).

Grand Manan, "in the laminarian zone, one specimen" (Stimpson).

* "Report on the Pycnogonida of New England and adjacent waters," U. S. Fish Commission Report for 1878, Washington, 1880, pp. 463-506, from which are extracted all the other quotations to which Dr. Wilson's name is here appended.

Family *Palleniidae*.

PSEUDOPALLENES HISPIDA (Stimpson).

Pallene hispida, Stimpson (1853).*Pseudopallene hispida*, Wilson (1878).

Grand Manan, taken by Stimpson in 1852 "among *Ascidiae callosae*, in deep water"; and by the U. S. Fish Commission in 1872, in 50 to 55 fathoms.

PHOXICHLIDIUM MAXILLARE, Stimpson.

Grand Manan, "taken in tangled groups of a dozen or more, attached to the under sides of stones at low-water" by Stimpson in 1852; and in 50-55 fathoms by the U. S. Fish Commission in 1872. Halifax, N.S., on piles at low-water, U. S. Fish Commission, 1877 (Wilson).

Family *Nymphonidae*.

ANMOTHEA ACHELIODES, Wilson.

1878. Trans. Conn. Acad. Arts and Sc., vol. v., p. 16.

Grand Manan, U. S. Fish Commission, 1872 (Wilson).

NYMPHON STROEMII, Kröyer.

Nymphon Stroemii, Kröyer (1844).*Nymphon giganteum*, Goodsir (1845); fide Wilson.

Nova Scotia: Cape Sable, N.W., eighteen to twenty-two miles, in 59 fathoms; eight miles and a half off Halifax, in 52 fathoms; and Bedford Basin, Halifax, in 35 fathoms; U.S. Fish Commission, 1877 (Wilson). Gulf of St. Lawrence, off Cap des Rosiers, in 125 and 110 fathoms, dredged by the writer in 1871 and 1872.

NYMPHON BREVICOLLUM, Hoek.

1881. H.M.S. Challenger Reports, Zoology, vol. III., Rep. on the Pycnogonida, pp. 19 and 45.

H.M.S. Challenger, Station 49 (May 20, 1873) south of Halifax, Nova Scotia, in 85 fathoms (Hoek).

NYMPHON MACRUM, Wilson.

1880. U. S. Fish Comm. Rep. for 1878, p. 487.

A single specimen was taken at Banguereau, Nova Scotia, in 1878, from the cable of the schooner Marion (Wilson).

NYMPHON LONGITARSE, Kröyer.

Taken by the U. S. Fish Commission in the Bay of Fundy in 1872; eighteen to thirty-two miles off Cape Sable, N.S., in 59 to 90 fathoms, in 1877; in the Narrows at the mouth of Bedford Basin, Halifax, in 16 fathoms, —and Chebucto Light, N.W. by W., eight and a half miles, in 1877; and in the outer harbour, Halifax, in 1879 (Wilson).

NYMPHON GROSSIPES (O. Fabricius).

Pyenogonum grossipes, O. Fabricius (1780).

Nymphon grossipes, J. C. Fabricius (1794); et auct.

"This and the preceding species are the commonest of the group. The most southerly locality from which I have seen specimens is Long Island Sound", "and the most northerly is Orphan Bank in the Gulf of St Lawrence, dredged by Mr. Whiteaves in 1873; Dr. Packard has recorded it from Labrador. Taken by the U. S. Fish Commission off Salem and Gloucester, 19 to 48 fathoms; Gulf of Maine, off Cape Ann, 18 to 90 fathoms; off Isles of Shoals; off Cashe's Ledge; off Cape Elizabeth; Casco Bay, common; St. George's Banks, 50 fathoms; common off Halifax, 16 to 101 fathoms; Bedford Basin, Halifax Harbour, 35 fathoms, soft, oozy, offensive black mud. In depth the observed range is from 12 to 110 fathoms. Like the preceding species, it is found upon nearly all bottoms, but it seems to be less of a muddy bottom species, and is more often taken on rocky or gravelly bottoms" (Wilson).

Taken, also, by the Challenger expedition, in 1873, at Station 49, south of Halifax, in 85 fathoms. Packard dredged it, in 1860, at Salmon Bay, near Caribou Island; and in 1864, at Square Island, Labrador, in from 15 to 30 fathoms.

NYMPHON HIRTUM, J. C. Fabricius.

Nymphon hirtum, J. C. Fabricius (1794); fide Wilson.

"Taken in great numbers off Halifax by the U. S. Fish Commission in 1877. It occurs on rocky, gravelly, or muddy bottoms, down to 50 fathoms. Sept. 24th., 1877, several hauls off Halifax, in 50 fathoms, muddy bottom, brought them up by hundreds, clinging to the meshes of the trawl-net" (Wilson).

CHORDATA.

UROCHORDATA (TUNICATES OR ASCIDIANS).*

Family *Didemnidae*.

LEPTOCLINUM ALBIDUM, Verrill.

1871. Amer. Journ. Sc. and Arts, Third Series, vol. I, p. 446.

"Grand Manan, 10 to 15 fathoms, 1870" (Verrill); abundant in the Bay of Fundy, low-water to 80 fathoms, U. S. Fish Commission, 1872 (Verrill). Between Pictou Island, N.S., and Cape Bear, P.E.I., Whiteaves, 1873 (Verrill); and "Mingan Islands, 10 fathoms", 1861 (Verrill). Labrador coast, Packard (Verrill).

LEPTOCLINUM ALBIDUM, var. LUTEOLUM.

Leptoclinum luteolum, Verrill (1871).

Leptoclinum albidum, var. *luteolum*, Verrill (1879).

"Eastport, Me., and Grand Manan, with the preceding species, 1870" (Verrill); Bay of Fundy, low-water to 80 fathoms, common, U. S. Fish Commission, 1872 (Verrill). "Under the name of *Didemnum roseum*, Sars" (which is said to have been "found frequently encrusting fucoids in masses an inch in diameter, in 10 fathoms, Hopedale, and on the whole coast" of Labrador) Verrill thinks that Packard probably included both this and the typical form of the species.

Family *Polyclinidae*.

APLIDIUM DESPECTUM, Herdman.

1886. H.M.S. Challenger Reports, Zoology, vol. XIV, p. 210.

H.M.S. Challenger, Station 48 (May 8, 1873) Le Have Bank, off Nova Scotia, in 51 fathoms (Herdman).

AMAROUCIUM PALLIDUM, Verrill.

Amourocium pallidum, Verrill (1871).

Amarocetium pallidum, Verrill (1873).

Amoracium pallidum, Verrill (1879).

"Eastport Harbour and Bay of Fundy, low-water to 80 fathoms," U. S. Fish Commission, 1872 (Verrill). Gulf of St. Lawrence, eight miles south-

* Nearly the whole of the Tunicates in the writer's St. Lawrence dredgings were determined many years ago by Professor Verrill.

east of Bonaventure Island, in 56 fathoms, stones and coarse sand, dredged by the writer in 1872, and subsequently identified with this species by Professor Verrill.

AMAROUCIUM GLABRUM, Verrill.

Amouroucium glabrum, Verrill (1871).

Amaroucium glabrum, Verrill (1879).

"Eastport Harbour and Grand Manan, low-water, under stones, to 60 fathoms, stony and shelly bottoms, attached to stones, shells, ascidians, etc., common, 1870" (Verrill). Le Have Bank, N.S., in 60 fathoms, U. S. Fish Commission 1872 (Smith and Harger). Gulf of St. Lawrence, dredged by the writer, in 1872, fifteen miles S.S.E. of Bonaventure Island, in 50 fathoms; also in 1873, on the Orphan Bank, and in Gaspé Bay.

Family Botryllidæ.

BOTRYLLUS. (Species undetermined.)

Gulf of St. Lawrence, dredged by the writer, in 1871, half way between Pointe des Monts and the west end of Trinity Bay, in 96 fathoms; and, in 1872, fifteen miles S.S.E. of Bonaventure Island, in 50 fathoms.

Family Ascidiidæ.

ASCIDIA COMPLANATA, Fabricius.

Ascidia complanata, O. Fabricius (1780).

Ascidia callosa, Stimpson (1852).

Ascidiopsis complanata, Verrill (1872).

"This species" (*A. callosa*) "is abundant in Passamaquoddy Bay from low-water mark to thirty feet" (? fathoms). "It is usually found adhering broadly by the left side to the under surface of large stones." Grand Manan, "very abundant on shelly bottoms, affording attachment to many species of zoophytes" (Stimpson). "Eastport, Me., and Grand Manan, at low-water mark under stones, in pools between tides, and at all depths to 120 fathoms, on stony bottoms, very abundant, 1870" (Verrill). Off Cape Sable, Nova Scotia, SS. Albatross dredgings of 1883 (Verrill). Between Pictou Island, N.S., and Cape Bear, P.E.I.; on the Orphan Bank, and at many localities in the Gulf of St. Lawrence, dredged by the writer in 1871, 1872 and 1873. "Abundant at the Strait of Belle Isle in 40 to 50 fathoms, occurring as on the coast of Maine, but growing to a larger size in masses affording shelter to various worms, Gephyrea, and Modiolariæ, and serving as a base of attachment to numerous Hydroids" (Packard).

ASCIDIA FALCIGERA, Herdman.

1880. Edinburgh Royal Society Proceedings, session 1879-80, p. 469.

1882. H. M. S. Challenger Reports, Zoology, vol. vi, p. 211.

H. M. S. Challenger, Station 49 (May 20, 1873) south of Nova Scotia, in lat. 43° 3' N., long. 63° 39' W., 85 fathoms, gravel and stones, eight or nine specimens (Herdman).

CIONA TENELLA (Stimpson).

Ascidia tenella, Stimpson (1853).

Ciona tenella, Verrill (1871).

Grand Manan, in 35 fathoms off Great Duck Island (Stimpson).

CHELYSOMA GEOMETRICUM, Stimpson.

Ascidia geometrica, Stimpson (1852).

Chelysoma geometrica, Stimpson (1860).

Grand Manan, "in 35 fathoms off Long Island" (Stimpson).

Family Cynthiadae.**GLANDULA FIBROSA, Stimpson.**

Grand Manan, "dredged in considerable numbers on muddy bottoms in the coralline zone. "They appear like hard balls of mud, about the size of an ounce bullet" (Stimpson). Between Cape George, N.S., and Port Hood, Cape Breton; dredged by the writer in 1873 (Verrill).

GLANDULA MOLLIS, Stimpson.

Grand Manan, "in 10 fathoms, sand (Stimpson); Bay of Fundy (Verrill).

GLANDULA ARENICOLA, Verrill.

1872. Amer. Journ. Sc. and Arts, Third Series, vol. III, p. 288.

Murray Bay, Sir J. W. Dawson (Verrill); and since dredged on St. Georges Bank, in 28 fathoms sand, by Professor S. I. Smith.

HALOCYNTHIA RUSTICA (L.)

Ascidia rustica, L. ; and O. Fabricius.

Ascidia monoceros, Möller (1842).

Cynthia condylomata, Packard (1867).

Halocynthia rustica, Verrill (1879).

Between Pictou Island and Cape Bear, P.E.I., Whiteaves, 1873 (Verrill); Murray Bay, very abundant, Sir J. W. Dawson (Verrill); Caribou Island, 8 fathoms, on nullipores (Packard).

HALOCYNTHIA PYRIFORMIS (Rathke).

Ascidia pyriformis, Rathke (1806).

Cynthia pyriformis, Stimpson (1853).

Halocynthia pyriformis, Verrill (1879).

Grand Manan. "It is one of the most beautiful marine productions found in this region, having in its hard velvety surface, and bright pink blush, precisely the aspect of a blood-peach. In fact, it is called *sea-peach* by the inhabitants. Some of my specimens are three inches in length." "It lives in clear water on rocky bottoms among nullipores, sometimes at low-water mark, but usually in 4 or 5 fathoms" (Stimpson). "Eastport and Grand Manan, from near extreme low-water mark of spring tides, under and among stones, to 50 fathoms, shelly and stony, common, 1870" (Verrill). Passamaquoddy Bay (Ganong). Off Cape Sable, N.S., SS. Albatross dredgings of 1883 (Verrill). Gulf of St. Lawrence, dredged by the writer in 1872, off Cap des Rosiers lighthouse, in 7 fathoms; and in 1873, on the Orphan Bank,—also between Pictou Island, N.S., and Cape Bear, P.E.I. Caribou Island (Packard).

HALOCYNTHIA ECHINATA (L.)

Ascidia echinata, L. (1767); O. Fabricius; et auct.

Cynthia echinata, Stimpson (1853).

Halocynthia echinata, Verrill (1879).

Grand Manan, "on rocky bottoms" (Stimpson); "Eastport and Grand Manan, at low-water under stones; and in 10 to 120 fathoms, not uncommon, attached to other ascidians, dead shells, stones, &c.," 1870 (Verrill). Chateau Bay, Labrador, at a depth of 50 fathoms (Packard).

HALOCYNTHIA TUBERCULUM (Fabricius).

Ascidia tuberculum, O. Fabricius (1780).

Ascidia carnea, Agassiz (1850).

Cynthia placenta, Packard (1867); pars.

Cynthia carnea, Verrill (1871).

Halocynthia tuberculum, Verrill (1879).

"Grand Manan, 15 to 20 fathoms, shelly," 1870 (Verrill); Le Have Bank, N.S., in 45 fathoms, U. S. Fish Commission, 1872 (Smith and Harger). Between Pictou Island, N.S.; and Cape Bear, P.E.I.; and fifteen miles S.S.E. of Bonaventure Island, in 50 fathoms; Whiteaves (Verrill). "Dredged in the Strait of Belle Isle, 40 fathoms, hard bottom; Henley Harbour, 10 to 20 fathoms, sandy; Cateau Harbour, Long Island," Labrador, in 15 fathoms (Packard—*C. placenta*).

PELONAIJA ARENIFERA, Stimpson.

Between Cape Breton and Prince Edward Island, and throughout Northumberland Strait, common, dredged by the writer in 1873. In 15 fathoms, sand, Salmon Bay (east of the mouth of the Esquimaux River, P. Q.) 1860 (Packard).

BOLTENIA BOLTENI (L.) and var. RUBRA.

Vorticella Bolteni, L. (1771).

Ascidia clavata, O. Fabricius (1780).

Boltenia Bolteni, Savigny (1818); and Packard (1867).

* *Boltenia reniformis*, MacLeay (1825); Gould (1841); and Stimpson.

Boltenia rubra, Stimpson (1852).

Boltenia clavata, Stimpson (1860); and Gould (1870).

Boltenia oviformis (Savigny) Packard (1863).

Grand Manan, on "rocks in deep water" (Stimpson). Le Have Bank, N.S., in 45 fathoms, U. S. Fish Commission, 1872 (Smith and Harger); and off Cape Sable, N.S., U.S. Fish Commission, SS. Albatross dredgings of 1883 (Verrill). Gulf of St. Lawrence, dredged by the writer in 1872, eight miles S.E. of Bonaventure Island, in 56 fathoms, three specimens, eighteen inches long, when alive,—and fifteen miles S.S.E. of Bonaventure Island, in 50 fathoms, two specimens nearly two feet long; and in 1873, at the entrance to Gaspé Bay, and off Cape Bon Ami, P.Q., in 30 fathoms. Bank off Caribou Island, Packard, who says that a "comparison with specimens from Greenland shows that this common species is found along our north-eastern coast from the Bay of Fundy to Greenland." •

BOLTENIA CILIATA, Möller.

Boltenia ciliata, Möller (1842).*Boltenia Burkhardtii*, Gould (1870).

Gulf of St. Lawrence, dredged by the writer in 1873 on the Orphan Bank, and off Cape Bon Ami, Gaspé, in 30 fathoms. Murray Bay (Sir J. W. Dawson).

BOLTENIA ELEGANS, Herdman.

1881. Edinburgh Royal Society Proceedings, Session 1880-81, p. 80.

1882. H.M.S. Challenger Reports, Zoology, vol. VI., p. 86.

"H.M.S. Challenger, Station 48 (May 8th, 1873) south of Halifax, Nova Scotia, lat. 43° 2' N., long. 64° 2' W., 51 fathoms, hard bottom, two specimens, one somewhat damaged" (Herdman).

Family *Molgulidae*.

MOLGULA PRODUCTA, Stimpson.

Five miles S.S.W. of the east point of Prince Edward Island, in 15 fathoms, sand, dredged by the writer in 1873 (Verrill).

MOLGULA PANNOSA, Verrill.

1871. Amer. Journ. Sc. and Arts, Third Series, vol. I., p. 55.

Bay of Fundy (Verrill, 1872); Orphan Bank, Whiteaves, one specimen; and Murray Bay, Sir J. W. Dawson (teste Verrill).

MOLGULA RETORTIFORMIS, Verrill.

1871. *Op. cit.*, p. 56.

"Bay of Fundy, 10 to 25 fathoms" (Verrill, 1872.)

MOLGULA LITTORALIS, Verrill.

1871. *Idem.*, p. 56.

Between Pictou Island, N.S., and Cape Bear, P.E.I.,—Whiteaves, 1873 (Verrill).

MOLGULA PAPILLOSA, Verrill.

1871. *Idem.*, p. 57.

Five miles S.S.W. of the east point of Prince Edward Island, with *M. producta*; Whiteaves, 1873 (Verrill).

EUGYRA PILULARIS, Verrill.

Molgula pilularis, Verrill (1871).¹*Eugyra pilularis*, Verrill (1872).

"Grand Manan, off Swallow's Tail, 15 to 20 fathoms, soft mud, 1870 (Verrill). Ten miles north of Shediac, N.B., abundant but small; off St. John River, Mingan, in 50 fathoms; Whiteaves (Verrill).

EUGYRA GLUTINANS (Möller).

Cynthia glutinans, Möller (1842).*Eugyra glutinans*, Verrill (1872).

Henley Harbour, Chateau Bay, Labrador, in 6 fathoms, sand (Packard).

PERA CRYSTALLINA (Möller)

Clavelina chrystallina, Möller (1842).*Pera pellucida*, Stimpson (1852).*Pera crystallina*, Verrill (1872).

"St. George's Bank, adhering to branches of *Sertularia polyzonias* in 30 fathoms" (Stimpson); Murray Bay, Sir J. W. Dawson (Verrill).

ERRATA.

(In counting from the top, the number of the page is not regarded as a line).

Page 11. Line five from the top, for "*Distiphannus*" read *Distephanus*.

Page 14. Line fifteen from top, for "Point" read Pointe.

On pages 18 (line eight from the bottom) and 29 (line eleven from the bottom) the words HYDROMEDUSÆ and SCYPHOMEDUSÆ should be in a little larger capitals, in the type elsewhere used for classes, not sub-classes.

Page 30. Lines ten and nine from the bottom :

for	"ALCYONARIA.	read	ANTHOZOA.
	ANTHOZOA."		ALCYONARIA.

Page 44. Line eleven from the top, for "Jaeger" read Gunnerus.

Page 61. Line two from the top, after 1883 insert a comma.

Page 64. Line seventeen from the bottom, for "*Typhocolax*" read *Typhlocolax*.

Page 135. Line three from the top, for "1847" read 1841.

Page 159. Line four from the bottom, for "*Machæoplax*" read *Machæroplax*.

